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THE Signature SERIES

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NETWORK WORLD

POWER

Our annual look at the people, companies, technologies and ideas transforming the network industry.

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002

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Plugging into power

Enlightened souls teach that inner power is the path to true strength. By all evidence, the networking industry has been experiencing a flowering of its inner power and strength. As events unfolded in 2005, we witnessed powerful corporate moves, insightful technology strategies, an upswelling of new products, technology and more. In this, our 12th annual Power Issue, we connect you to all the sources of the network industry's inner power — the people, companies, technologies and ideas.

Beth Schultz, editor, Signature Series
bshultz@nww.com

Power Companies

Connecting you to the network industry's most powerful vendors.

The Power 15

Eight companies with mega power, four with proving to do, and three contending for a place among the power elite. ***PAGE 6***



Your power perspectives

Net execs — such as Joe Granneman (at right) — name the most powerful network vendors. ***PAGE 18***

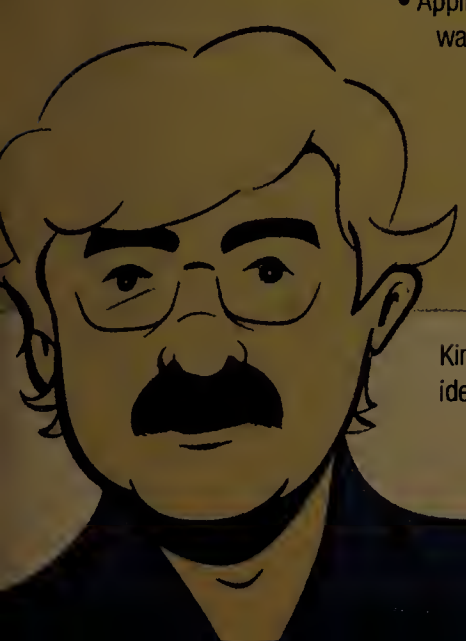
Power winners — and losers

Five columnists declare which vendors are rising and slipping in power. ***PAGE 20***

Power of Technology

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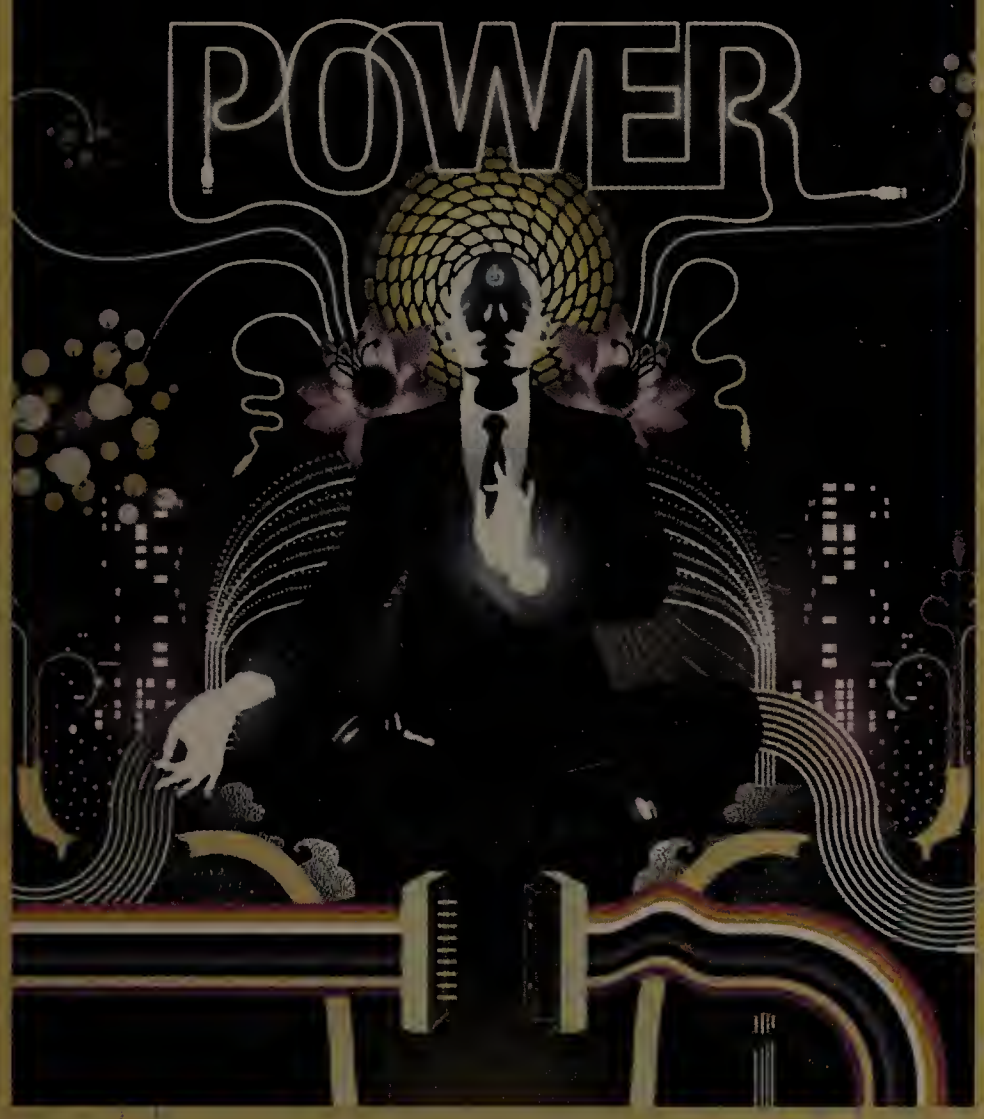
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Tap into more Power

Go online for an interactive timeline of vendor power plays, an alphabetical listing of our 50 most powerful people in networking and more.

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Signature Sign-off

Powerful influences

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THE Signature SERIES

The Power Issue is one of the six bimonthly supplements providing insights, opinions and information the the biggest trends shaping the networked world. next up: The Best, Products Issue, coming Feb. 27

■ **CONTACT US** Network World, 118 Turnpike Road, Southborough, MA 01772; **Phone:** (508) 460-3333; **Fax:** (508) 490-6438; **E-mail:** nwnews@nww.com; **STAFF:** See the masthead on page 18 for more contact information. **REPRINTS:** (717) 399-1900

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COVER ART: PHIL WHEELER

POWERcompanies

A LOOK AT THE MOST POWERFUL NETWORK VENDORS



//The Power 15
We look at eight companies with mega power, four with something to prove and three contending for power. See story at right.

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The Power 15

By JULIE BORT AND BETH SCHULTZ

In this annual look at power among network vendors, we've divided 15 power-brokers into three categories: those with mega power, those with something to prove and those who are quickly climbing toward the highest power tier.

Eight with mega power

These network vendors have built up their influence during years of market dominance, technology prowess and leadership savvy. They set the standard for their respective markets.

Cisco

When looking over Cisco's moves in 2005, industry watchers no doubt see a long list of muscle-flexing maneuvers.

The router giant completed 11 acquisitions in 2005, including its much-heralded $6.9 billion purchase of video-system maker Scientific-Atlanta. The move puts Cisco in pursuit of the next big thing — an IP television-equipment market for consumers — with enterprise implications. As video creeps onto enterprise networks, Cisco will have Scientific-Atlanta's expertise to help develop infrastructure products.

The company also made news with its purchase of wireless LAN (WLAN) switch start-up Airespace, a $450 million deal announced in January and completed in April. This was an interesting "if you can't beat 'em, buy 'em" strategy, because Cisco previously dissed the idea of WLAN switches and thin access points. Industry watchers widely lauded the about-face as good news for the evolving WLAN market: Cisco gains a low-cost WLAN product line for midsize companies and wireless management technology to boost the functionality of its mainstay Aironet fat access points, and enterprise users get more options from their network vendor of choice.

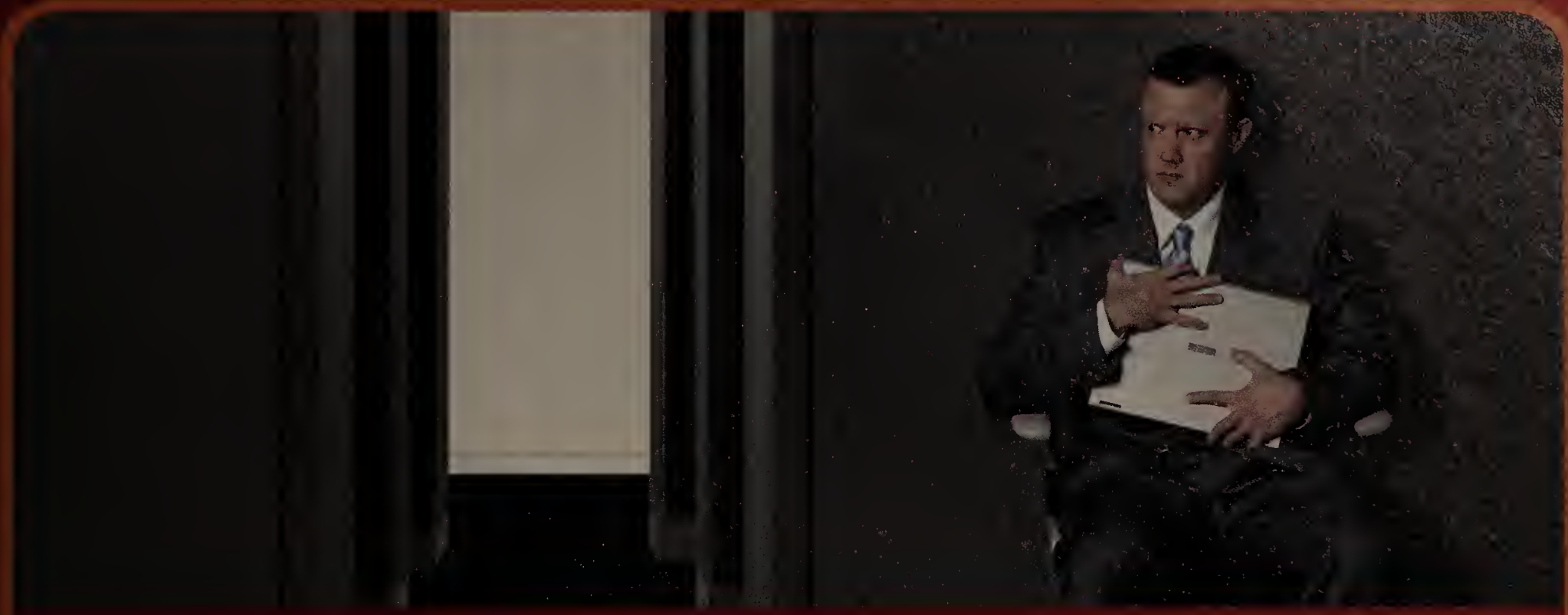
Also of note are Cisco's April acquisition of InfiniBand switch maker Topspin Communications, through which it gains a toe-hold in enterprise data centers, and the Application-Oriented Networking (AON) strategy announced in June. AON will give application-processing powers to network gear. Likewise, Cisco's IP Interoperability and Collaboration System allows IP devices to be built with push-to-talk capabilities.

Clearly, Cisco is looking eagerly for new markets to conquer.

Power 15 continued on page 8

Security breaches cost businesses billions each year.

(Will you be ready, or will you be a statistic?)



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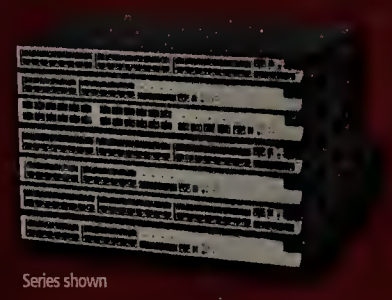


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EMC

Understanding some of the reasons EMC is one of the top power players in the network industry today means looking over its VMware strategy. To expand its line of business, EMC bought an interesting little company that in 2005 became the de facto means of implementing server virtualization and made its way to mass corporate acceptance. In the process, EMC itself extended its power presence with hands that now stretch beyond enterprise storage and into systems management. In 2005 VMware exceeded the $100 million revenue mark in the third quarter and now boasts an installed base of more than 10,000 customers, with 90% reporting the virtualization product deployed in production environments, according to VMware.

Beyond VMware, EMC increased its power position with the February Smarts acquisition. With Smarts, EMC cements its entry into next-generation, business-focused systems management. Mix in an extensive array of document management wares — documents, Web content, imaging and workflow — and it all adds up to a powerfully clear message that EMC regards itself as an information life-cycle management company.

To be fair, EMC didn't neglect its storage mainstay in '05. It spent the year increasing its Clariion and Symmetrix lines, expanding into iSCSI and launching the Celerra NSX network-attached storage system.

In 2005 EMC also appears to have learned how to partner better, announcing a deal in June to support Sun Solaris. However, it has yet to join wholeheartedly in the era of open source. This was made plain when arch-rival IBM in October created an open source group — with the much-publicized absence of EMC and HP. EMC still has work to do on becoming a team player, increasingly a demand that network executives make of key vendors.

IBM

If IBM had a theme in 2005, it was open source. In January, Big Blue opened 500 of its software patents to open source developers. Later it orchestrated the Open Invention Network, a multivendor group that will buy patented technology and make it available to open source developers, and cosponsored Aperi, an open source organization that will develop storage-management software.

IBM does have a profitable method to its madness, as is demonstrated by its May Gluecode acquisition. Gluecode offers support and services around a stack of open source middleware, including an application server, portal database and business-process management engine.

With Gluecode, IBM can compete with JBoss, another open source app server. Since the acquisition, IBM has announced plans to release a community version of its WebSphere Application Server based on the application server in the Gluecode stack, Apache Geronimo.

This version will become the low end of the WebSphere application-server lineup. The plan is that once users do their initial development work using the open source stuff, they will want to port to a network-ready, commercial version of WebSphere for their production environment, and upgrade from there as their requirements grow.

But IBM certainly isn't giving all of its wares away. It was 2005's top vendor in worldwide server revenue, according to IDC and Gartner. It also led in blade-server revenue, outsourcing deals and selected tape-storage products, according to various analyst reports. It used its financial might for a shopping spree, announcing 15 acquisitions in the last 12 months. Among the most significant are the March acquisition of application service provider Corio and the October buyout of XML-acceleration vendor DataPower. It ended the year by buying both portal software maker Bowstreet and network management software maker Micromuse in late December.

As for technology innovation, in mid-year IBM announced plans to create middleware for RFID systems, pushed its way into the blade PC market (a form of next-generation thin clients) via an agreement with EMC's VMware and Citrix Systems, and created a new business unit focused on information-management wares.

It also moved ahead on grid initiatives, offering a grid starter pack in August and licensing commercial releases of grid middleware from start-up Univa.

INTEL

Intel may consider Advanced Micro Devices and its dual-core Opteron processor a thorn in its side, but the chip giant won't be losing control of the x86 market anytime soon. Consider Apple's June defection from IBM PowerPC chips to Intel processors, for example.

Still, Intel spent considerable time this year strategizing how to reduce the sting from AMD's advances. For example, it committed to create a next-generation architecture with ultra-low power consumption and to bring virtualization technology to its Itanium and Xeon processors, as well as to its Centrino mobile technology. Intel also entered the dual-core age, albeit late. In November it brought the technology to all its Xeon processors for low-end servers. Dual-core Itanium 2 processors are still in the works, as are multicore processors.

Intel also continued exploring technology options beyond the basic chip. In August, for example, it acquired XML acceleration and security start-up Sarvega. Although the short-term plan has Intel selling and supporting Sarvega's XML appliances, the real prize for Intel is Sarvega's hardware-independent XML operating system for optimized XML processing and security. Acquiring that dovetails with Intel's strategy of using software to enhance its chipset and other products such as network adapters.

Elsewhere, Intel continued its push on WiMAX, the wireless broadband access technology for business customers.

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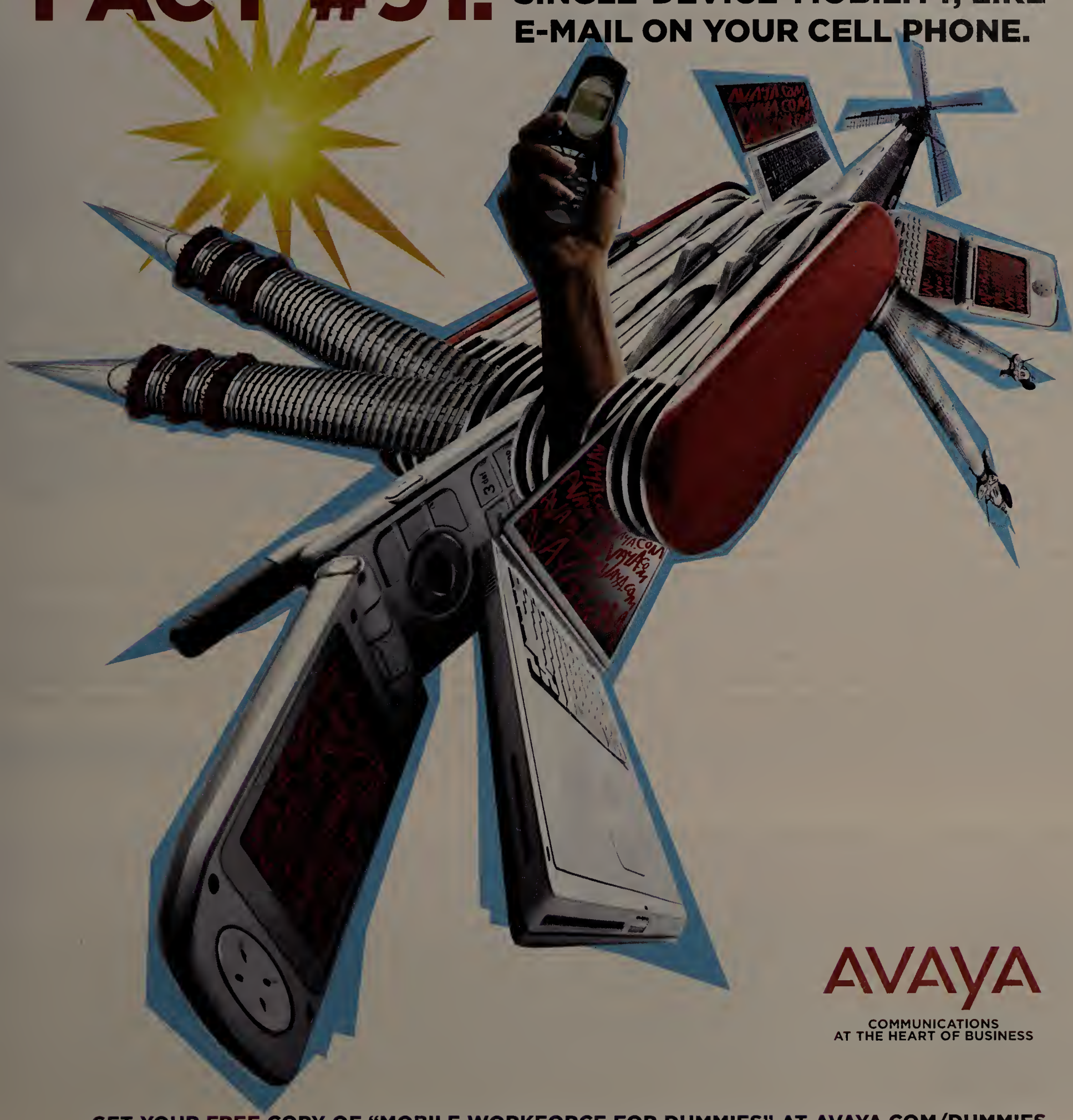


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MICROSOFT

For Microsoft, 2005 may well be remembered as the year CEO Steve Ballmer hurled a chair while cursing Google CEO Eric Schmidt. True or not, the much-repeated story leaves the lasting impression of a shaken giant. Certainly Microsoft has felt the heat from companies such as Google, Salesforce.com and Red Hat, which are promoting the idea that Microsoft is no longer innovative enough to deliver the next generation of enterprise software. Microsoft honchos know the company needs to change and they no doubt would prefer 2005 being remembered as the year they began reshaping Microsoft as a software-as-a-service provider.

In other power-enhancing strokes, Microsoft teamed with Cisco to support and implement a proposed IETF standard for allowing VoIP calls to traverse firewalls without compromising security; said it would seek standardization of the XML formats it is developing for the forthcoming Office 12; and committed to producing 64-bit versions of upcoming server operating systems. Microsoft also used product introductions to gun for presence in the new data center. For example, it began shipping Visual Studio 2005 and SQL Server 2005, released a preview of BizTalk Server 2006 and announced the Beta 2 release of the high-performance Windows Compute Cluster Server 2003. In August, the company reaffirmed its road map for Virtual Server 2005, which will continue as a separate product after Microsoft releases its next server operating system in 2007. In October it released a virtualization licensing model for Windows Server System that could lower costs for server users and help advance industry efforts to define software licensing for virtualization.

Microsoft faced its share of fires in '05, including the employee defections that reportedly put Ballmer into such a snit, the continued attack on Windows by virus writers and hackers, and open source encroachment. Power does have its downsides.

ORACLE

Oracle's thirst for acquiring enterprise applications via acquisitions showed no signs of slowing in 2005. Oracle acquired 13 companies, including CRM vendor Siebel Systems in a $5.9 billion buyout announced in September. That puts Oracle on track to do serious battle with SAP. The bidding war it successfully waged in the spring against SAP for retail-management software vendor Retek provides an interesting clue to where Oracle is heading. In winning Retek's customer base, a gold list of top retailers, Oracle sets itself up for a host of database, integration and CRM opportunities. Retailers have done a relatively poor job of capitalizing on their enormous customer-data stores. An enterprise software company that can help retailers — which operate on tiny margins — grab more money from their customers will surely reap profits for itself..

Oracle also pushed further into identity management through the acquisitions of Oblix in March, and OctetString and Thor Technologies in November. Not content to own the high-end database world while taking over enterprise software applications and identity management, Oracle gunned after the low end too. It intends to offer a free version of its 10g database and released a beta version in November. Although 10g is not an open source product, the move is clearly aimed at MySQL, a popular open source database.

With its growing influence within the application sector and the bulldog fierceness of flamboyant CEO Larry Ellison, Oracle's power remained steady in 2005.

SYMANTEC

Chowing down on Veritas in a $13.5 billion acquisition wasn't enough to stave off Symantec's hunger for new and different technology. Three months after that deal closed in July, Symantec was off to the smorgasbord again, this time picking out BindView Development, Sygate Technologies and WholeSecurity — all for policy-enforcement purposes.

But technology via acquisition is not Symantec's only strategy. In 2005, the company introduced several all-in-one gateways for enterprise users. These combine VPN and firewall, anti-spam and anti-virus software, Web filtering and other security functions in a single appliance. It began offering a hosted e-mail service for filtering spam and viruses, and controlling compliance. Joining the trendsetters merging systems and security management tools, Symantec also unveiled a slew of client-management applications.

If Symantec gets its way, it will soon be known as a trendsetter in storage management too. Witness its Veritas acquisition and efforts to align data storage management and security into a utility computing story. The company also has jumped into the fray with continuous data-protection software, a new type of storage technology that backs up data instantly for recovery at any point in time (see related story, page 34).

On the downside, Symantec's sterling reputation with Wall Street has slipped a bit in recent months, where questions about the Veritas strategy still loom large.

VERIZON

Plotting the $8.4 billion MCI acquisition (still awaiting some state approvals at press time) may have occupied much of Verizon's energies in 2005, but it hasn't been all-consuming. Throughout the year, the carrier sweet-talked enterprise network executives with promises of next-generation services such as optical VPNs, IP voice and EV-DO-based cellular data services. Verizon even entered the managed services business, with outsourced security and storage offerings, and now offers a text-based enterprise messaging service for wireless business customers.

Verizon hasn't overlooked the need for sheer speed, either. By May, the carrier had wrapped up the first phase of Enterprise Advance, a program for wiring major cities, starting in the Northeast, with high-speed links. Users along the Route 95 corridor apparently like the bandwidth boost — Verizon says it had signed up 150 large customers by the completion of Phase 1.

Verizon also reports big customer gains for its wireless and broadband lines. Verizon Wireless added 1.9 million users during the third quarter, for example, bringing its customer base to 49.3 million, the company says. It also added 389,000 new broadband (DSL and fiber-to-the-home) connections, a quarterly record.

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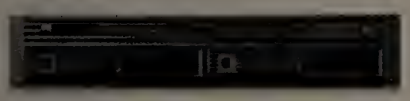


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Four with something to prove

These companies offer great technology, tell a good strategic story and have won over many enterprise customers. However, they've slipped up over the course of the last year or longer. Now they're on the proving ground.

Power 15 continued from page 10

CA

The thing about CA (now officially renamed from Computer Associates) is that you can never count it out. In 2005, CA moved into recovery after years of a legal and political maelstrom. Righting the company has been John Swainson, who officially became CEO in February after holding the president and CEO-elect positions since November 2004. Swainson spent his first year cleaning house, replacing executives, revising salesforce compensation, reorganizing management structures and making product enhancement a top priority.

In November, CA launched three new products and updated 26 existing ones, including three key enterprise products, Unicenter, eTrust and BrightStor. For instance, Unicenter 11 has new agent technology and is based on a new database, and the company finally integrated its management platform onto a single, underlying technology." This keeps it in line with the general network-platform integration trend.

CA also promoted its next-generation, business-oriented management strategy.

ETrust is No. 2 in security management, and CA hopes to further its name there by beefing up its offerings. It launched a new identity management entry, CA Identity, based on technology acquired in 2004 from the purchase of identity management vendor Netegrity.

Given how dependent an enterprise grows on its network and security management platforms, CA could well work itself back among the industry's mega powerful companies.

HP

At HP, 2005 saw a whirlwind of corporate activity to improve operations and boost revenue. In February the board ousted Carly Fiorina as CEO, bringing her six-year reign to a close and signaling its disappointment with the company's performance since the Compaq merger she orchestrated. In March the board appointed Mark Hurd, a former NCR executive, as the new CEO. In July Hurd unveiled a restructuring plan that included some 14,500 layoffs.

At the same time, HP aggressively expanded its technology portfolio through acquisition. It bought Trustgenix, for its federated identity server; RLX Technologies, for Linux-based server-management software; Peregrine Systems, for asset-management software; and AppIQ, for storage-resource management software.

Likewise, HP built its server, systems and storage lines to woo enterprise IT executives architecting next-generation infrastructures. In May, for example, it released a slew of storage products, including appliances for speeding data access and file sharing between remote offices and the data center. Recently it rolled out utility computing services, which customers can pilot before committing to using them. In management, HP in June unveiled products designed to help customers better manage compliance across their network infrastructure and monitor service-oriented applications from development to deployment. Indeed, application management is its next big opportunity.

SBC

SBC closed its $16 billion acquisition of AT&T in November, at last completing its transformation from a RBOC to a global carrier — on paper, at least. The deal gives SBC, which adopted the AT&T moniker, the scale of a true giant. It is now the country's largest telecom provider, with a forecast of $85 billion in 2006 revenue. With such bulk, the new AT&T will likely find itself second only to IBM on the '06 *Network World* 200 list of largest North American network players. Now the real fun begins, as the new entity begins merging and purging employee bases, operational systems and network infrastructures, all while catering to the ever-more sophisticated demands of its newly expanded enterprise accounts.

As the pre-merger SBC sorted out its business affairs in '05, the old AT&T continued upgrading its services portfolio and making infrastructure improvements all in the name of IP. It added IP VPN capabilities, enhanced its Web hosting services, prepped new security services, unveiled a hosted IP PBX service and teamed with Microsoft to develop collaborative services.

The carrier also began planning how to move legacy services onto its global MPLS network. In wireless, it renewed its commitment to WiMAX, a fixed broadband wireless technology, for business customers.

If the old SBC is to recapture the glory of the old, old AT&T, it must quickly capitalize on this IP legwork and create an advanced enterprise services portfolio.

SUN

While Sun hasn't managed to find stable profitability, it remains a pacesetter in several areas. In September, it launched its Opteron-based server line in the hopes of snagging more of that lucrative low-end market. Sun has been sharing the third-place market-share spot with Dell for worldwide server revenue (although it slipped a notch behind Dell in the third quarter), with IBM in No. 1 and HP at No. 2, according to IDC. Sun may further its server position when its eight-core, energy friendly SPARC chips, called Niagara, begin shipping in a new Sun Fire family.

Sun also drew applause from the open source movement in June, when it made good on its promise to release an open source version of Solaris. By October, Sun reported distributing more than 3 million copies of the operating system. In November, Sun announced it would offer all of its software for free in hope of encouraging the open source developer community to build more apps for its platform. Following IBM's lead, Sun removed legal restrictions on 1,670 of its patents — many of them related to Solaris.

Sun looked toward partnerships too, to spread Solaris. In the fall, IBM announced that its BladeCenter servers would support Solaris. Egenera soon echoed that pledge for its BladeFrame x86 blade servers. Sun also made headlines for its acquisitions of enterprise application-integration software maker SeeBeyond Technology, for services-oriented architecture technology, and storage systems vendor StorageTek.

Power 15 continued on page 14



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Three contenders

Many network vendors are gunning for a spot among the mega powerful, but these three have the technology, the drive and the gumption to succeed.

Power 15 continued from page 12

AVAYA

Avaya used 2005 to tear it up in the VoIP market. Analysts place Avaya neck and neck with Cisco in enterprise telephony market share, with each owning about 25% of the worldwide market. Avaya's hybrid PBX approach, joining TDM and VoIP, attracts users who aren't ready to hand over voice entirely to IP. Its emphasis on professional services and support for third-party software development also win kudos.

In June Avaya shook hands with Research In Motion to bring Wi-Fi VoIP to the loyal BlackBerry user base and expanded its relationship with Juniper Networks to include joint development of convergence products. The ongoing joint development effort between Avaya, Motorola and Proxim to create wireless voice products bore more fruit this year too, in the form of Wi-Fi and cellular roaming technology. In July it partnered with IBM to integrate VoIP into IBM's instant messaging and conferencing products. In September it announced a deal with Sprint to develop wired and wireless hosted VoIP services. It also announced a managed service for small- and midsize business (SMB) IP users, in conjunction with XO Communications. It backed up its interest in the SMB market in September when it acquired peer-to-peer VoIP product maker Nimcat. Avaya also unveiled the results of its partnership with SAP, announced last spring, in which Avaya's IP telephony technology added alerting, messaging and conferencing to mySAP applications.

The Avaya of today could be a business student's case study for the core competency business model. Its focus on convergence means that it restricts itself to three areas: IP telephony products, contact-center wares and IP-based mobility. As a $4.9 billion company (for fiscal 2005), the 5-year-old Avaya is far smaller than some of its competitors, like the $14 billion Alcatel (as of 2004). But the upside for its users is that Avaya also has only one set of customers to please — the enterprise network executive.

GOOGLE

There's a line in the movie "Yours, Mine & Ours" in which the love-struck character played by Dennis Quaid confides in his buddy that he was up all night "googling" a woman. Google, like FedEx before it, has become an American verb. That in itself doesn't make its power noteworthy to the enterprise network executive. But if you take Google's enormous brand-name recognition, its Wall Street love affair, its network-industry CEO and its interest in technologies such as VoIP and enterprise search, you get a company worth watching — even worth googling.

Google's power crescendoed in late December when it blocked Microsoft from becoming a search-engine partner for AOL. Microsoft had reportedly been attempting to partner with AOL, but instead Google retained its position as AOL's search engine — which generates a lot of ad revenue for Google — and agreed to pay AOL $1 billion for a 5% stake, Google said. The two also revamped how they will divvy up ad revenue stemming from the partnership.

The expectations for Google are huge. Some think it will be the one to topple Microsoft from the desktop, if it adds calendar and word processing to its e-mail and IM functions. (The possibility has been the subject of much debate, stemming in part from its vaguely worded partnership announcement in October with Sun, maker of StarOffice.)

If not Microsoft, where might Google flex its power next? Industry cocktail parties have been made by the Google-acquisition guessing game. Should Google buy TiVo? Should it buy a Linux thin-client vendor? It has begun dabbling in consumer VoIP services — will it pick up VoIP vendor Vonage? What would be the implications if it were to buy a classic enterprise vendor such as Sun or Novell? Much imagination is required to see the $3.2 billion Google (as of year-end 2004) as a powerful network player alongside IBM. Yet network executives that don't put Google on their watch list simply aren't paying attention.

JUNIPER

For Juniper in '05, it was all about the enterprise. Through acquisitions and R&D, the vendor continued its enterprise venture; in so doing it has positioned itself as a go-to vendor for security and application performance improvements. Juniper might not have the volume of Ethernet router ports that Cisco has, but it is showing what it takes to get the enterprise eye — and a fair amount of nods too. According to the company's third-quarter '05 report, enterprise now accounts for one-third of Juniper's yearly revenue of more than $2 billion. Enterprise product sales were up 17% quarter over quarter, according to the company.

Juniper's '05 acquisitions include Funk Software, for network-access security; Kagoor Networks, for VoIP gear; Peribit Networks, for WAN-optimization technology; and Redline Networks, for application front-end processing. The company's security enhancements include intrusion detection, SSL VPNs and a policy management appliance. The latter reveals Juniper's determination to rival Cisco and Microsoft with its secure network-access scheme. ■

The biggest news stories

Layoffs, executive oustings, billion-dollar buyouts: We chart the biggest news stories of 2005 in this interactive timeline. **Go to www.nww.com, DocFinder: 1431.**



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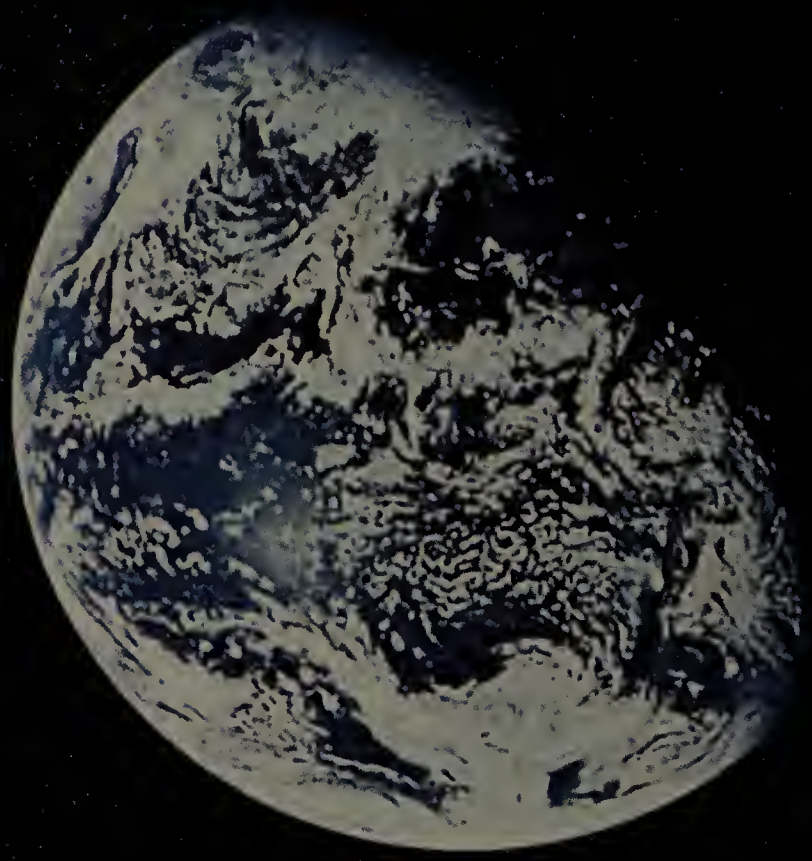
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Your power perspectives

Net execs name the most powerful network vendors.

By JOANNE CUMMINGS

Ask network executives which vendor wields the most power in their network today and they'll say Cisco, but ask them which holds the second-highest place and many will name a niche security vendor.

With an estimated 70% enterprise market share, it's no surprise that most users say they rely on Cisco for the bulk of their network infrastructure. "There's safety in that market share," says Bill Ashton, director of IT for the town of Herndon, Va., which uses Cisco for its VoIP network. "No IT exec I've ever heard of has been fired for deciding to go with Cisco."

The network giant is so well entrenched that few organizations look elsewhere for network gear. "We're a Cisco shop, and that's who we are and it's who we stay with," says Kent Hargrave, CIO at Overlake Hospital Medical Center in Bellevue, Wash., which uses Cisco for its wireless and wired network infrastructures. "I'm not going to look at anyone else."

But many users are beginning to see the problems of going solely with all-powerful Cisco. "When companies get very big, they tend to be a bit complacent," says Greg Chottiner, CIO of University of Maryland University College (UMUC), a public distance-learning university in Adelphi, Md. (see "Chasing the big one," page 58). UMUC's core network is Cisco, but its VPNs, firewalls and Web-acceleration technology hail from Juniper Networks. "It's tough turning that large ship to respond to customers. Many times, Juniper responds faster, and its products are cheaper because it doesn't have Cisco's overhead," Chottiner says.

Security rivals

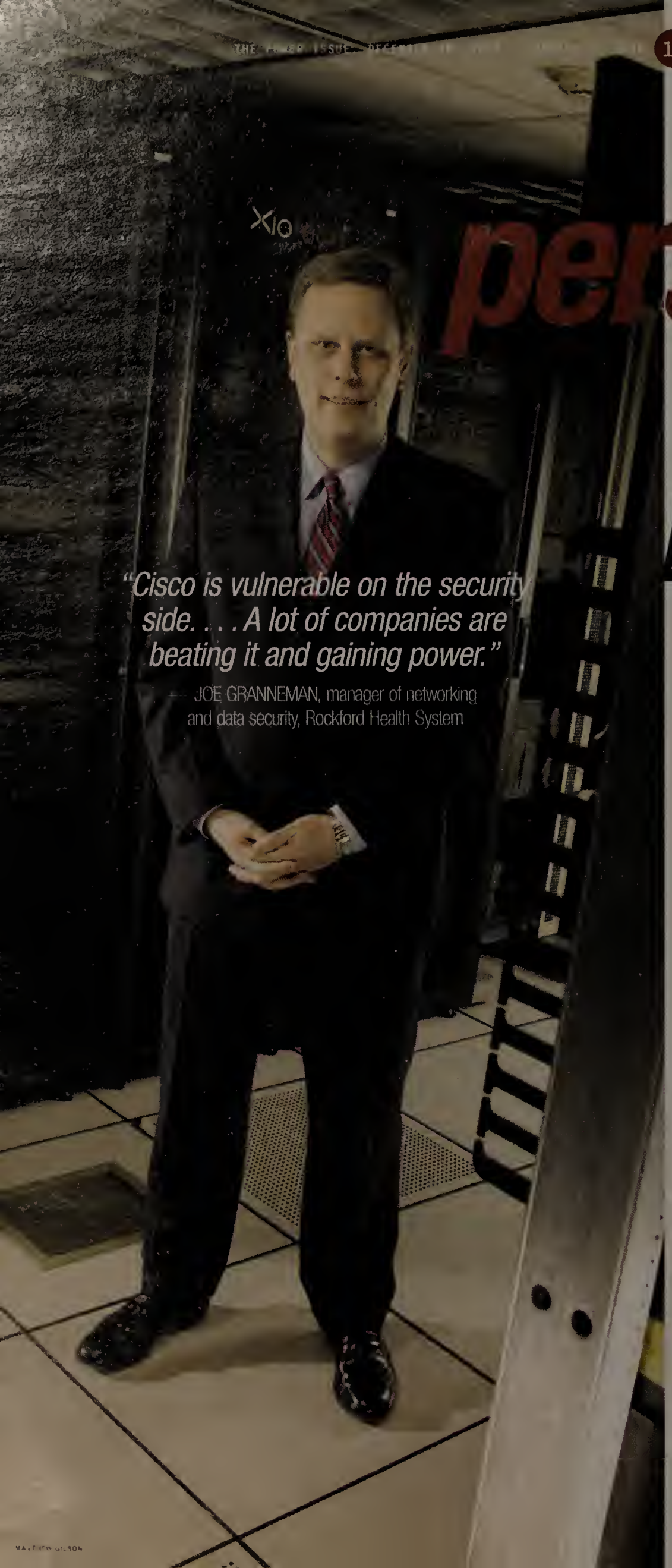
Almost all agree that the area where Cisco doesn't navigate quickly or well enough is security. "Cisco is vulnerable on the security side, though it doesn't want to hear that," says Joe Granneman, manager of networking and data security at Rockford Health System in Rockford, Ill. "A lot of companies are beating it and gaining power."

Granneman's network, though based on Cisco switches, relies on Juniper's NetScreen firewalls and Top Layer Networks' intrusion-prevention systems (IPS). "On the security side, I really like Top Layer. Its devices aren't terribly expensive, and they just tend to run," he says. "I think those niche players are the ones who will succeed, because that is something that Cisco is trying to do but doesn't do well."

Even staunch Cisco supporter Overlake Medical Center agrees security isn't Cisco's strong suit. "We use Aventail for our SSL VPN," says Jeff Bernstein, network engineer at the hospital group. "It's one clear area where we said Cisco just isn't really strong. We did an evaluation and found that both Juniper [with its Neoteris technology] and Aventail had better products, and we decided on Aventail."

Herndon's Ashton says straying from Cisco in security, especially in the light of recent vulnerabilities within Cisco's IOS and its IPS-configured routers (see www.networkworld.com, DocFinder: 1421) makes sense. "When you have diverse and rising threats that you have to continually try and stay one step ahead of, the best practices in security dictate that you go with best of breed, in IPS [and intrusion-detection systems], firewall, remote access, host protection and so on," he says. "Smaller companies in these niches have an appeal. Cisco is trying to sell homogenous security products that just don't work as well."

Beyond Cisco and security firms, Microsoft, IBM and Citrix Systems all are well positioned



in today's networks, users say.

"We have migrated to IBM hardware," says Brian Young, vice president of IT at Creighton University in Omaha, Neb. "Its new blade servers allow us to ramp up capacity on demand for things like registration or Webcasting a sports event or graduation. IBM definitely wields power here."

Young also cites Microsoft as a key vendor, adding that its power works to his school's benefit. "The one thing Microsoft has done is that it's forced a lot of application vendors to think about how they'll integrate with Active Directory or Exchange or different types of Windows-based environments," he says. "In that sense, it makes it easier for us to integrate applications into the campus."

Citrix is a rising networking star at Rockford Health System, primarily because of its ease of management and key security features, Granneman says. "We're putting computers now in places where they haven't been in the past, like in patient rooms," he says. "But how do you maintain a computer in a patient room?"

Thin-client pricing has come down on par with cheap PCs, but Granneman says he figures Citrix can save $200 per client in management and maintenance costs. Citrix also uses less bandwidth, which is ideal in wireless situations, and it offers better security than traditional PC solutions.

"I have people at home who want to access health data, but how do I keep that data from hitting their home PC?" he says. "With Citrix, the data never resides on the client. It's more secure. Citrix has a strong future."

Open source power

Another player that wields considerable power in today's networks is not a vendor, but a movement: open source.

"Being an airline, we're obviously under a lot of dollar strain," says Devin York, senior manager for IT financial systems at Continental Airlines, a large HP user based in Houston. "We use open source where it makes sense. It's definitely making inroads in the server world, where you don't need a nice GUI."

York uses HP 9000 Superdome servers to consolidate more than 50 application servers for six departments. "We're starting to see Linux ramp up at the high end, on the multiprocessor Superdomes and all your cell board technology-type systems. It's definitely getting more powerful."

Open source also is powerful in the network tool arena. "It's really saved us, because we've been able to use open source tools to provide a lot of value as an IT organization to fix network issues, especially security issues," Granneman says.

Granneman uses several open source tools, including the Snort IDS, the Nessus vulnerability scanner and the Ethereal network sniffer. These all perform the same or better than commercial tools, but at no cost, he says. That is, until recently. He predicts that open source is beginning to fade as a network powerhouse, now that many tools are bought and commercialized.

"Open source used to work for users' benefit, but lately, I'm not so sure. [Check Point] bought Snort, Nessus closed its source and is going to fee-based signature updates, and I'm just waiting for Ethereal to go away," he says. "It's the best network sniffer you can get — you'd pay a fortune for something like that from Network General — and I've never been able to get one of those in the budget."

Power wanting

Some network markets are still waiting for an all-powerful contender to emerge, users say. These include desktop-security management, integrated network and security management, and end-to-end data encryption.

"Today, desktop security is unstructured," UMUC's Chottiner says. "There are hundreds of companies that do anti-spyware and anti-spam, but there isn't one company that stands above and takes this all together and provides one all-inclusive solution. I think that's a place where we could use a little more power."

Another area is network-security management. "There's usually an application that comes along that changes the world a little bit, like Mosaic did," Granneman says. "In networking, I think the power will go to the one vendor that can integrate network management and network security. There's a lot of integration required and an enormous amount that could be done."



"Open source is definitely making inroads in the server world . . . at the high end."

— DEVIN YORK, senior IT manager, Continental Airlines

The vendor that pushes a standardized way to handle encryption throughout the life cycle of data is poised to gain power, Continental's York says. "Today, we have to spend a lot of money reengineering things and making sure data is protected and we're compliant with privacy regulations," he says. "But in the future, you hope that some vendor, software or hardware, builds it in in a standard way so you don't have to worry about it."

Creighton's Young agrees, noting that he finds PKware, with its SecureZip data encryption and PKzip compression, a step in the right direction. "PKware is an up-and-comer that is making strides, because it has already decided that we live in a networked world and its 100% focus is your need to protect yourself in that environment," he says.

Today's rising fuel costs and volatile stock market make for a risky financial environment, and that opens the door for smaller companies to grab network power, he adds. "When we're financially strapped, it makes it an opportune time to look at the players who are smaller in the market but really want to make some inroads," he says. "It may be more risky, but it's cheaper and more innovative. Sometimes that's where the power is."

Cummings is a freelance writer in North Andover, Mass. She can be reached at jocummings@comcast.net.

//Cisco, the benevolent

Net execs attribute Cisco's success to its use of power for the good of customers.

Large, powerful vendors tend to polarize users. For example, users either love Microsoft or hate it. But Cisco, despite its girth, doesn't spark such strong reactions.

"I don't believe Cisco causes the polarization that a company like Microsoft does," says Bill Ashton, CIO for the town of Herndon, Va. "Cisco is that man behind the curtain that only the IT people see, and among that group, it's strong. Even in my small operation, I've never felt neglected by it."

Jeff Bernstein, network engineer at Overlake Hospital Medical Center in Bellevue, Wash., says Cisco puts effort into integrating all the pieces of the network, which works for the good of users. "Cisco has some kind of product that fits virtually everywhere on a network. You may not get best of breed, but the stuff works together, and if it doesn't, you can throw it back on Cisco's lap and it'll take care of it," he says.

Cisco is forced to work for the good of customers, because rivals are always at the ready to unseat it, Bernstein adds. "If customers really felt that Cisco was to their detriment, they may not do it the first year, but eventually, they'll find ways to get it out of their environment. Eventually, it will go away."

Ashton agrees. "It's difficult to argue that a company like Cisco uses its power to the detriment of customers — they still hold huge market share," he says. "People would start leading with their feet if they were using their power to the detriment of customers."

— *Joanne Cummings*

Power. Winners — and losers

Five columnists declare which vendors are rising and slipping in power.

//eBay/Skype: Giving the calls away for free

By Howard Anderson, "Yankee Ingenuity"

Let's think inside the box for a change, understanding that communications is the Ultimate Reality-Distortion Universe, where assets are really liabilities, customers have loyalty so low that it can be measured in picoseconds, and every vendor yearns for yesteryear when there were real profits.

In this universe, the power winner is eBay/Skype. ("Howard, you are nuts as a bunny. EBay/Skype isn't a carrier or even a technology equipment company, it's a middleman.") Let's think this through. EBay paid $4 billion for a company with sales of $60 million that essentially gives its product away. Communications cost is now effectively zero. Consumers have figured out that if you are just technically conversant enough, you shouldn't have to ever pay for communications again. Those are the early adopters of VoIP; eBay is betting that the whole system goes mainstream by 2007 and that all those eBay buyers/sellers will be using eBay/Skype.

But it goes even further. Can it make money where there is not money to be made? Yes, if you look at eBay as kind of a Google clone delivering some sort of advertising/communities to businesses that want to address them.

Which other companies will jump in? Players will include Google, Yahoo, Microsoft, even AOL — any that understand the "free with added features" concept. This is Ivan Seidenberg's (Verizon CEO), Duane Ackerman's (BellSouth CEO), Ed Whitacre's (AT&T, formerly SBC, CEO), nightmare — a company that gives away its product and may even pay customers to call. And doing the same thing wirelessly!

Years ago, IBM invited me to address its management committee, a bunch of senior, balding, white guys who ran the place, along with Miss Ellie (Ellen Hancock). I suggested the day was coming when computing, storage, software and communications would be free. The committee responded as if I were a closet commie who should immediately retreat to Cambridge where my ilk came from. But have you figured out what your cost per MIP is today? Or what the open source movement does to software pricing? At the same price, each year, communications cost drops 66%, storage drops 50%, processing drops 45%. It's all free, and free is very tough to compete against.

Let me say that again. Free is very hard to compete against. If you want directory assistance today, be prepared to pay $1.50 per call. But you really don't do that much any more, do you? You go to Switchboard.com and get exactly the same information for free. You, not someone in Bangalore, are the computer operator, and you barely notice the ad at the bottom. The switchboard makes money, you get information for free and the advertiser gets a shot at you. This is what eBay and others are up to.

> ***"Consumers have figured out that if you are just technically conversant enough, you shouldn't have to pay for communications again."***



powerwinner
eBay/Skype
powerlosers
Existing carriers, then wireless carriers, and in the long run companies such as Cisco, Motorola, Lucent and Juniper.

A counter example? Music — if you want free, be prepared to listen to 20 minutes of junk ads per hour ... or go to iTunes at 99 cents per song ... or satellite radio for $12.95 per month. Same with TV. The opposite of free is pay-per whatever. Choices, lots of them. If I am traveling to Vermont, I can buy a map at an Exxon for $4.95, I can get a route guide from Mapquest for free or I can use GPS and Bitching Betty ("Turn immediately left Howard, you idiot!") for $200 per year.

VoIP isn't new. Vonage raised all sorts of venture capital money; 10 years ago I was skulking around a back alley in Tel Aviv and I found one of the first VoIP companies. Its system was the ultimate kludge, but it worked. Today that solution is industrial strength, strong enough for eBay. The quality is fine, the technology is stable and communications is just another feature, like Google Maps. Communications, thinks eBay, can be packaged and delivered at essentially zero marginal cost — especially if you are willing to put up with bothersome ads or pass the litmus test as a true eBayer. It is unlikely that those ads will be intrusive — sending you messages in the middle of your conversation, like suggesting male supplements while you are talking to a prospective date. But the cool guys at eBay (or Google/Yahoo/Microsoft) may note that you are talking to area code 312 — and they might want to suggest a local flower merchant or a steak house or an airline that flies there. I know this is far beyond what eBay does today.

Let's take this further. Let's assume that you are a Platinum buyer/seller on eBay and would like free wireless communications and a state-of–the-art BlackBerry-like service. No problem, just move up to "Steroid" level — and you will be dealing in "eBay dollars," sort of an e-currency that can be used to buy, sell or even trade — kind of like frequent flier miles but geared to your online world. Other companies could be American Express and Citibank. Communications cost has become and will become the ultimate giveaway, kind of like toaster ovens were two decades ago.

The losers are the existing carriers and then the wireless carriers. How about the arms merchants — the Ciscos, Motorolas, Lucents and Junipers of the world? No, in the short run, yes in the long run.

Who is left? Who will actually pay real money for communications? The poor, the old, the technologically challenged. The rich? Don't be silly. The rich are very cheap — which is how they stay rich.

Anderson is senior managing director of Yankeetek, a Cambridge, Mass., venture incubator. He can be reached at handerson@yankeetek.com.

People told Columbus

the world was flat.

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//IBM: Back into networking

By Frank Dzubeck, "Industry Commentary"

IBM, as a network vendor, has been riding a power roller coaster. It has gone from being the most powerful vendor to a big power loser and now back again as a big power gainer. It all began in 1976 when IBM introduced SNA and ushered in the first age of networking. For over 15 years, IBM used SNA to dominate the mainframe-based IT industry. "Open" was a word that did not exist within its vocabulary. Its proprietary innovation continued into network management, with NetView in 1986, and then shortly thereafter with access services within the IBM Global Network (IGN).

But then the IT industry changed, and customers got smarter. IP began to replace SNA and distributed computing was all the rage. IBM fought rather than joined the trend. It engineered IEEE 802.2 Token Ring for the LAN and ATM/OSI for the WAN, missing opportunity after opportunity to become a leader in the second age of networking. That legacy mentality finally ended in 1995 with IBM's commitment to open computing and networking. It purchased the multivendor management company Tivoli in 1996 and became a powerful bigot for open standards and the Internet. IBM then began to offload the past by selling the IGN to AT&T in 1998 and the Network Hardware Division to Cisco in 1999. This allowed a focus on creating a new IBM. In doing so, it began to internally redefine the term "networking."



"The definition of networking has forever changed within the corporate environment in 2005. . . . Without a doubt, IBM is . . .

back into the network business big time."

powerlost IBM

powerregained IBM

IBM's strategy was right on the mark. IP is ubiquitous and the Internet is a primary vehicle for commerce, consumer entertainment and personal/corporate communications. Ethernet is becoming the dominant form of connectivity for computers, storage and more. Networking has shifted to the last frontier — the applications layer. Business, not technology, is the driving force in the third age of corporate networking. IBM is in the forefront of almost every area of product and service delivery in this new age. It leads the assault on business componentization through its Professional Services organization. It has helped create the link between business processes and technology using a services-oriented architecture (SOA). IBM has recognized its core competencies and focused its powerful corporate resources on research, services, software, computers and storage with its on-demand strategy.

Within that strategy we find the new age routers, switches, caches, gateways, security, management and so forth. These new network entities are not packet-based but message-based. They are all contained in software and firmware as SOA services, not hardware infrastructure, and are implemented using an open reference architecture and industry standards. IBM's market differentiation in an open world is in using IBM research for "special sauce" within its software products and problem-solving intelligence for services.

IBM has been using an aggressive acquisition strategy coupled with organic development and partner programs to fill in numerous missing product and services slots in its SOA. The net result is filling out its SOA strategy with New Age network services:

- User access and interaction services contain network portal and collaboration mechanisms.
- Application services are based on open Web services to affect application interoperability and routing.
- Information management services contain static and dynamic caching, meta-directory search and routing, and networked database federation.
- Business process services are based on activity choreography and policy.
- Virtualization services normalize the application and user view of compute, storage and network resources regardless of physical location or technology constraint.
- Service-level management uses workload assignment and balancing, orchestration for configuration, security monitoring and policy, net/systems management of faults and autonomic availability activity.

These services are tied together through an Enterprise Service Bus, distributed software that performs brokerage, gateway, routing and switching functions for the delivery and interoperability of multivendor SOA services and applications. Just as the Tivoli acquisition in 1996 matured into an entire SOA Management Services product suite, so has the 2003 acquisition of Rational Software matured into the development portion of IBM's SOA strategy. Using the current IBM SOA product portfolio makes it possible to:

- Model and simulate a corporate business process, and identify the required links to other internal or external business processes.
- Create process-management service-level agreements (SLA) and governance requirements; identify existing and new IT application and information resources required to implement that business process; and model and simulate the IT applications required to implement the business process.
- Generate the SLAs and policies required for optimum and secure operations.
- Create needed IT applications using standardized software components; monitor the testing of the process and the applications; and deploy the applications.
- Manage the process and application performance, security and compute/storage/network resources against business policy in an almost automated manner.

The definition of networking within the corporate environment has forever changed in 2005. The latest arguments are not about speeds and feeds but about where application intelligence should reside — within the classical definition of a network or at the edges within the domain of IT and corporate business managers.

Without a doubt, IBM is the most powerful vendor in this new network age. It is back in the network business big time with global reach, industry segment market focus, customer confidence, an open-mined standards philosophy and valuable partner/alliance programs in place.

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//Nortel lags where Tellabs finds success

By Thomas Nolle, "Reality Check"

IT would be hard to find two network players that, over the years, seem more steeped in conservatism than Nortel and Tellabs. Both companies drew their past revenues from the big iron of TDM. But it would be hard to find two companies that, in 2005, diverged more in trajectory. Tellabs is beating industry players such as Cisco and Juniper Networks in stock performance, and Nortel is lagging.

Why is that? Well, three factors seem linked to success in the network equipment space. They are strategic vision, customer engagement and management credibility. Let's see how Nortel and Tellabs measure up to each.

In the strategic vision area, Nortel decided to abandon the DSL access market in 2001, reentering it later through an alliance with Calix. This means that in the critical period when common carriers were preparing to deploy consumer broadband, Nortel had no offering at all, and during the deployment had only a partner offering. Tellabs, in contrast, purchased Advanced Fibre Communications, a DSL incumbent, and Vivace Networks, a new-generation packet edge device. It's leveraged both into DSL access deals with carriers.

Also interesting is Tellabs' active membership in the IPsphere Forum, a group of carriers and equipment vendors working to define how common carriers can deploy IP in ways that preserve profit and ROI. Recent European equipment deals, including ones from France Telecom, BT and Telenor, seem to draw from the membership of IPsphere, which includes giants such as Lucent, Cisco, Juniper and Alcatel. Nortel is not a member.

In the customer engagement area, Nortel and Tellabs both have relationships with the common carriers, but Tellabs seems more capable of pushing those to the next level to expand outside its TDM incumbency. Its home page features a solution portfolio, a demand-driven family of products that targets the problem set the carrier is likely to identify with. Nortel's home page gives more space to its "This is the way..." branding campaign than to any product strategy or buyer need.

The real differences show in management credibility. Nortel has been paralyzed with accounting investigations, management changes and defections, Cisco execs who show up and then leave, Wall Street angst ... you get the picture. In contrast, Tellabs has not had any accounting issues, it's had fairly stable management, its CEO took the reins last year with minimal drama, and Wall Street seems to like it.



powerwinner Tellabs
powerloser Nortel

The management problem is perhaps the most challenging because it has created a real loss of momentum for Nortel and demoralized many employees. Breaking the destructive negative cycle will be all the harder for this deterioration of morale, not to mention the loss of key people who just didn't want to take the risk that Nortel might be acquired. At Tellabs, morale is high, losses are minimal, and there is a sense of mission and progress.

"Nortel floundered, waffled, changed directions and lost its way."

These two companies started to diverge as the bubble collapsed. Tellabs kept its eye on the strategic future of the industry, invested in the right things, created a positive and relevant customer message. Nortel floundered, waffled, changed directions and lost its way. Tellabs inspires, Nortel confuses. It's as simple as that.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at tnolle@cimicorp.com.

//SCO out, VMware in

By Mark Gibbs, "Backspin" and "Gearhead"

Winning may not be everything, but losing has little to recommend it. — Sen. Dianne Feinstein (D-Calif.).

Picking the network vendor most quickly losing power is easy. That company would be SCO.

At one time a respected company, SCO launched itself down the path of self-destruction when it filed suit against IBM in March 2002. It alleged that IBM had "made concentrated efforts to improperly destroy the economic value of Unix, particularly Unix on Intel, to benefit IBM's new Linux services business." The lawsuit also charged IBM with "tortious interference, unfair competition and breach of contract."

Now, more than three years later, we're no closer to seeing this case resolved, as SCO still hasn't shown the code it claims violates its intellectual property rights. What it's done is spend a lot of money in creating a legal swamp that has effectively sucked in all rationality, leaving nothing more than hyperbole and hand waving behind.

SCO's tactics in this fiasco have been to try to scare corporate Linux users into buying SCO's protection licenses to avoid possible future litigation and creating a smoke screen of doubt in the Linux market. In the process the company has seen its revenue collapse while it burns through cash reserves.

"SCO will eventually shrivel up and blow away but not before it has wasted our time, wasted its shareholders' money and gained the enmity of everyone in the computer business."



powerwinner VMware
powerloser The SCO Group

The latest foolishness came last summer when SCO asked IBM for "all documents concerning IBM's contributions to the Linux 2.7 kernel." This was curious, as there is neither a Linux 2.7 kernel nor plans for such a thing!

SCO will eventually shrivel up and blow away but not before it has wasted our time, wasted its shareholders' money and gained the enmity of everyone in the computer business.

Picking the network vendor most quickly gaining power is somewhat harder. Even so, while many companies are having a transformative effect on the computer market, one vendor is at the very forefront of acquiring power: VMware.

VMware's virtual machine products are some of the best in the market and its financial performance has been stunning: VMware's third-quarter revenue this year was a record $101 million, a 63% increase year over year.

What is driving this success is obvious: The enormous benefits of server consolidation. Most enterprises find the utilization of the majority of their servers to be very low individually. With VMware they can, in many cases, consolidate servers to the extent of migrating up to 10 physical servers over to 10 virtual machines on a single physical server.

Particularly interesting is VMware's recent release of the VMware Player, a virtual machine runtime system that can execute virtual machines created not only with VMware's products but also those created using Microsoft Virtual PC. This system could transform software distribution for publishers and enterprises by becoming virtual shrink-wrap.

Despite the competition from Microsoft, the Xen project, Parallels and Swsoft, I expect VMware's experience in servicing the enterprise market will maintain the company's leadership.

Gibbs can be reached at mgibbs@gibbs.com.

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//Intel inside networking

BY DANIEL BRIERE, "TELECOM CATALYST"

With networking being built into everything from tennis shoes to pocketbooks, the real show these days is at the edge and in the appliance space. Major brands are moving to sell networking as part of their products. Sony wants to sell you VoIP. Nintendo wants you to use its Wi-Fi at McDonald's. Before long, Virgin will be selling IPTV service in the United States.

Talk to any start-up, and its technology strategy usually centers on "reducing this all to the chip level" — and that's where the big cost-savings and efficiencies come into play. The biggest player in networking today is also the largest chip vendor in the world, Intel.

Intel dabbled in DSL, looking at ways to optimize its relationship for high-bandwidth applications, but really made its mark in Wi-Fi with Centrino. Then Intel planted itself right in the middle of the VoIP market with the most popular chip set, codec and add-on boards for IP PBXs. Now Intel is pushing for WiMAX in the same fashion. It's buying up XML firms (Sarvega) and other enterprise software players. We're running into Intel in Hollywood, cutting licensing deals with the consumer electronics vendors to build software libraries. Intel realizes that it starts with the chip and then goes to the chip's software ecosystem, and is bidding to be a full-scale solutions company. Networking is core to that.

As Intel sucks more into its ecosystem, traditional network vendors have to do some reinventing to stay powerful. Key network players have used industry consolidation, corporate expansion and other lateral moves to stem major power losses lately. For example, Cisco has been increasing the size of its pie through acquisitions (Linksys and Scientific-Atlanta, for example) to keep ahead.

Alcatel likewise has made some important — nay, impressive — business and market share wins in the edge router market and in IPTV/passive optical networking. Its deals with Microsoft for systems integration on the RBOC IPTV rollouts and continued moves in wireless/wireline integration are making Alcatel a tough competitor.

Juniper has more of a problem as a network player, and has lost some of its market sway. While there were hopes of further bold moves after the NetScreen purchase, Juniper really has not made any major market moves to gain breadth and share as you'd expect of a power player. While its market share gains have been steady, its power gains have not been there. Relative to the competition, Juniper needs to make some bolder moves to get more and deeper traction into the enterprise — the core markets are simply not going to keep growing at the pace we've seen lately. So profitable, yes; powerful, not as much as it was when the market was more narrowly defined.



powerwinner Intel
powerloser Juniper Networks

Briere is president of TeleChoice, a market strategy consultancy for the telecom industry. He can be reached at telecomcatalyst@telechoice.com.



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POWER of technology

EARLY ADOPTERS SHARE HOW EMERGING TECHNOLOGIES HAVE EMPOWERED THEIR ENTERPRISES



//Virtualization magic
Early adopters of application virtualization software share tales of reduced costs, better security, easier management and more. See story at right.

//A great reputation
Early users are wowed by how well reputation services keep spam off the network. PAGE 30

//Priceless protection
Early adopters love the peace of mind they get with continuous data-protection tools. PAGE 34

Virtualization

Application virtualization has the power to cut costs, improve security and ease management, early adopters find.

Heartland Financial IT execs Marti Vandemore (left) and Shane Nicely at first hesitated to go with largely unproven application virtualization technology, but decided the potential pros outweighed the cons.

MATTHEW GILSON

BY BETH SCHULTZ

Three years ago, IT officials at Heartland Financial USA were in a jam. They wanted to migrate from distributed computing to a centralized terminal services environment using Citrix Systems. But they had no way to determine a hardware budget for the project.

"We knew we'd need to create silos in the Citrix server farm based on application conflicts, but we didn't know which of [our 160 applications] would

Virtualization continued on page 32

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SSL VPN Grows Up

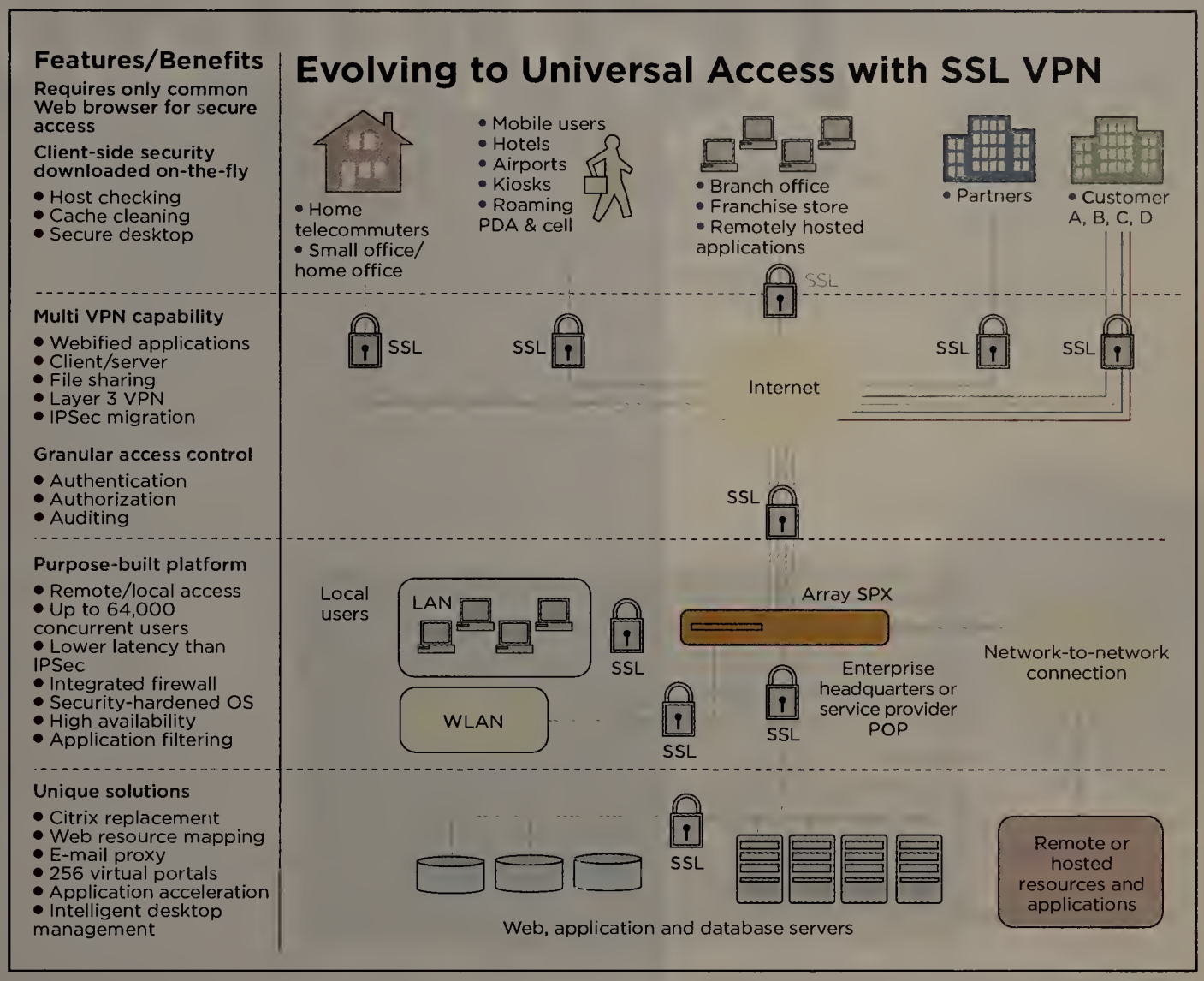
SSL is becoming the VPN technology of choice, with products from vendors like Array Networks delivering high performance, ease of use and cutting-edge security — at a low cost.

It wasn't long ago that the Secure Sockets Layer (SSL) protocol was used chiefly as a means of providing secure connections to Web sites, such that consumers would feel comfortable sending their credit card and other personal data over the Internet. Today, SSL is increasingly being used for corporate virtual private networks (VPNs) providing secure access to various corporate resources for an organization's own users as well as customers and business partners.

SSL VPNs are being deployed as an alternative to VPNs based on the IP Security (IPSec) protocol, and with good reason. SSL VPNs are far easier to deploy because they require only a Web browser to be present on the client machine. IPSec requires client-side software, which means IT must "touch" every client that is to participate in the VPN.

SSL VPNs also provide more security options. If a computer connected via IPSec is infected, it can quickly infect the rest of the network. SSL VPNs from companies such as Array Networks act as a full reverse proxy, creating a "virtual divide." The user's session is terminated at the VPN device, so the user never has a presence on the network. That enables the system to ferret out and drop suspicious connections before they do any damage.

At the same time, today's SSL VPNs offer more functionality than the previous generation, such as highly configurable access control capabilities that include a security health check on each client, improved manageability without costly agents on each end point, and the ability to provide access to virtually any corporate IT resource, from applications to printers.



An Exploding Market

Customers are getting the message. IDC says the market for SSL VPN appliances—the most prevalent form of SSL VPN—was $200 million in 2004, up an "incredible" 172% from the prior year. By 2009, IDC estimates the market will reach nearly $900 million in revenue, a compound annual growth rate of 35% from 2004.

In its March 2005 report on the SSL VPN market, IDC says it believes the market for clientless solutions will be "extremely dynamic" in coming years, with "exceptional growth, predicated on continued deployment of Web-based remote access applications and services." But growth won't be limited to remote access; SSL VPN use within a corporate LAN will likewise greatly expand as companies seek to provide tighter access controls to corporate resources from within their own walls, IDC says.

Given the expanded role that SSL VPNs are now playing, researchers at Frost & Sullivan even came up with a new name for the product category: Resource Gateway.

Frost & Sullivan argues that the term "SSL VPN" doesn't adequately describe what products in the category do. From an enterprise user's perspective, the objective is to provide "a means to control and optimize end user interactions with useful resources," Frost & Sullivan says in its August 2005 report on SSL VPN's. Those resources can include not only business applications, but file shares, network-connected devices such as printers as well as other end user machines, Frost & Sullivan says.

To compare the various products in the market, Frost & Sullivan rates them on each of three functional requirements: connectivity, security and performance. The company assigns each vendor to either the lower tier or upper tier in each category.

Array Networks Shines

Frost & Sullivan puts Array Networks in the top tier in each of the three categories. The Array SPX Series SSL VPN products combine three attributes that Frost & Sullivan says are essential for success: scalability, functional extensibility and adaptability.

In terms of scalability, Array's SPX Series supports up to 64,000 users and 100,000 simultaneous connections per device, with throughput of up to 850M bit/sec—making it the world's fastest and most scalable SSL VPN product. Array Networks' systems perform eight times faster and scale 12 times higher than the nearest competitor. Array also supports as many as 256 virtual portals on a single system, enabling users to create "instant DMZs" that segment different user communities. All this adds up to Array delivering the lowest total cost of ownership to its customers.

It should be no surprise, then, that Array products are deployed in some of the largest, most demanding organizations, including four of the world's top 10 banks, five of the top 10 communications service providers and more than 20 percent of the Global 2000 enterprises.

As Michael Suby, a senior research analyst with Frost & Sullivan and the author of its report puts it, "Array is one of the limited number of vendors with broad functionality in all three functional categories—connectivity, security and performance."

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A great reputation

Early users are wowed by how well reputation services keep spam off the network.



BRUCE HERSHEY

By JULIE BORT

How do you fight spam if words such as Viagra or sex are part of legitimate e-mail? If you're James Brady, e-mail administrator at Cedars-Sinai, a Los Angeles hospital, you turn to reputation services. The latest anti-spam weapon, reputation services analyze sender behavior, not e-mail content, to determine spam.

"Healthcare has a lot of terminology that might be considered spam — and no tolerance for false positives," he says, adding that the hospital's previous spam-fighting tool caused so many false positives that administrators yanked it out and just dealt with the junk mail.

Brady now uses IronPort Systems' reputation-services appliance at the network's edge, as well as the Symantec BrightMail anti-spam add-on module. That gets him a second layer of reputation-services analysis plus traditional content filtering. With this three-layer approach, Cedars-Sinai catches more than 90% of 55,000-plus spam messages it receives daily, Brady says. The gateway appliance alone detects most of the spam with low false positives, at about one per 1 million, he says.

Reputation-services technology is powerful because it does what no other anti-spam offering can — drop the spam at the gateway before it clogs up servers and WAN links. At Cedars-Sinai, one-third of spam sent its way never gains entry to the network and e-mail server.

"Healthcare has a lot of terminology that might be considered spam — and no tolerance for false positives."

JAMES BRADY, e-mail administrator, Cedars-Sinai

None the wiser

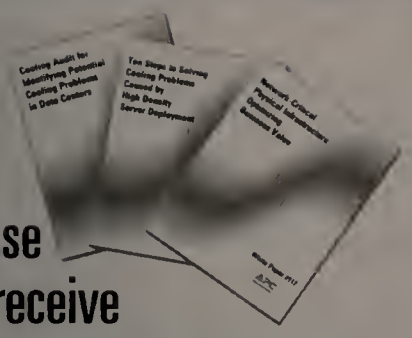
Vendors vary in their approaches, but in general reputation services profile the sender's behavior and thereby determine the likelihood that a message is legitimate or spam. For instance, if a high volume of messages come from the same IP address, the IP address doesn't accept mail in return, the country of origin is one where a lot of spammers operate and the sender began using the IP address that morning, the reputation service will smell a rat, says Tom Gillis, senior vice president for IronPort.

When the reputation service determines a message has a high likelihood of being spam, the device can respond in a couple of ways. If configured aggressively, it will drop the mail, and the e-mail server is none the wiser. Mark Fitzgerald, messaging and groupware operations manager at Key Corp., a financial-services company in Cleveland, Ohio, loves that option.

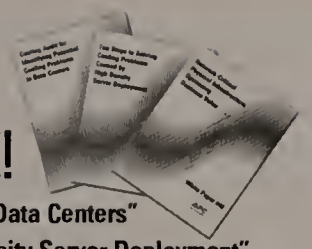
After some tweaking of his IronPort appliance, he found that "it has the ability to take a large chunk of the spam away at the perimeter," he says. Like Brady, Fitzgerald says a layered approach works best. With the BrightMail enterprise content-filtering system included on the device, he's stopping 98% of about 14 million spam messages received monthly. Fitzgerald now rarely touches the device. "We don't have to manage the reputation part of it all that much. Because of the way we have our rules set, and because our users have a zero-tolerance for false positives, we're fairly lenient. We'd rather let some questionable stuff through the perimeter and then let BrightMail deal with it," he says.

Even if the sender's reputation is not clearly good or bad, these appliances can help. The IronPort device for example, throttles down the volume of messages it allows to pass to the e-mail server, Gillis says. If the sender is trying to send 100 messages and the sender's reputation is questionable, the IronPort device can be set to accept, say, 10 messages, returning

Spam continued on page 32



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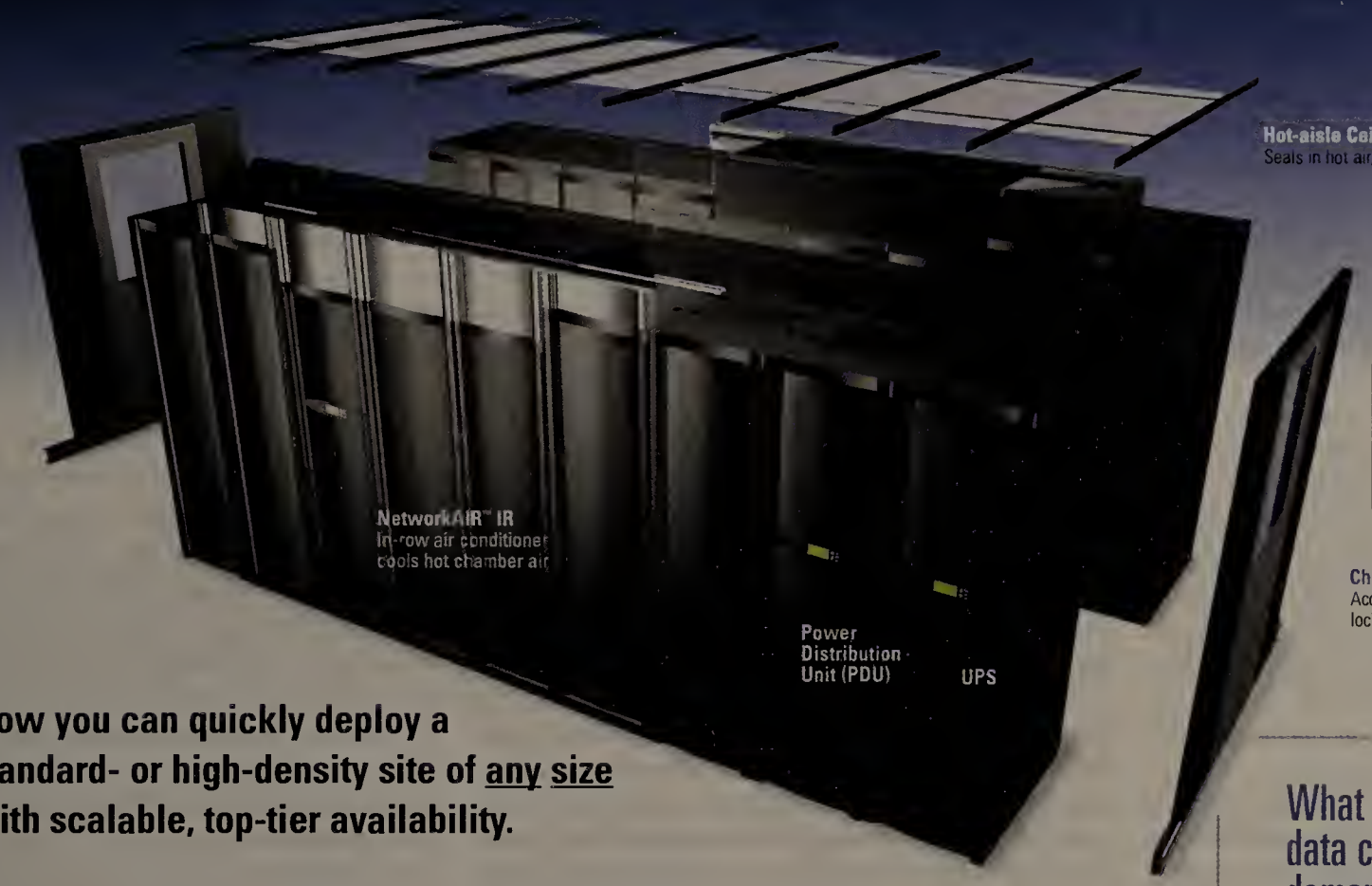
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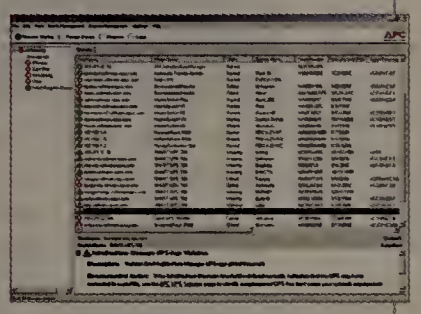
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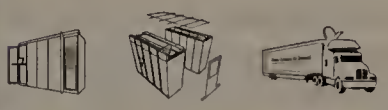
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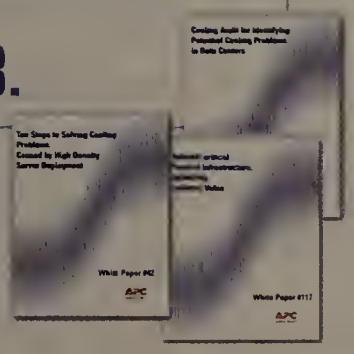


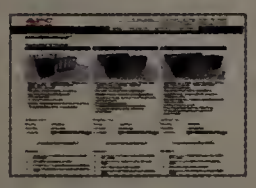
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Virtualization continued from page 28

work well together and which wouldn't. Not knowing how many silos we would need made it impossible to cost out the hardware," explains Marti Vandemore, vice president of IS at the Dubuque, Iowa, regional banking firm.

A light bulb went off for the IT executives while listening to a Softricity presentation at the Citrix iForum user conference later that year. As the vendor explained how its virtualization software lets applications run independently of the host operating system and one another, they realized this newfangled technology might be the answer to their problem. Because these "containerized" applications could run on a single server without conflict, they would not need those server silos that were causing them such budgetary grief.

Application virtualization products, from Softricity as well as IBM Meiosys, Trigence and others, are distinguished by their ability to isolate an application in a logical container. The container, which holds everything the application needs to operate — meaning its core executables and binary code files — acts as an intermediary between the application and the operating system. Individual configuration settings and other non-essentials live outside the container, says Warren Wilson, an analyst with Summit Strategies, in a recent research report.

This differs from application treatment within a virtualized server environment, a la VMware. With server virtualization, for example, different applications and operating systems may coexist on a single server, but the applications remain dependent on the operating system. System overhead and performance would remain issues when dealing with applications that require their own operating system instances, Wilson says in the report, adding that application virtualization efforts began as a way to address server virtualization shortcomings.

At Heartland Financial, the IT team hesitated to go with the largely untested application virtualization technology but then decided the pros outweighed the cons, Vandemore says. Application virtualization, via the Softricity Desktop, would facilitate the IT team's move to centralized support of Heartland's nearly 60 banking locations across nine states. With that centralization would come a more secure environment that would be easy to back up, patch and keep in compliance with auditing regulations, he adds.

Within six months, IT began migrating to the centralized computing environment that now comprises 35 Citrix servers supporting almost 800 concurrent users. It has virtualized more than 80% of applications for a user population that almost exclusively relies on thin clients, says Shane Nicely, the bank's assistant vice president of IS.

The benefits are mounting: User support is much easier, with help-desk calls lasting 80% less time than previously. Change management for Sarbanes-Oxley Act compliance is far less onerous, as IT no longer needs to test upgrades and patches for silo conflicts and to make sure they don't put the application into non-compliance. The application environment is more secure, with patch deployment taking one-fifth the time previously required and disaster-recovery planning simplified. Plus, IT has been able to maintain its help desk staff size despite the bank's aggressive growth, Vandemore says, adding that he expects to realize payback on the investment well within his initial two-year target.

The advantages provided by this technology have far-reaching business implications, Summit Strategies' Wilson says. "This technology can help companies reduce overhead and align IT investments more closely to business needs and processes," he says.

Such has been the case at Lend Lease, a multinational construction management company with global IT operations managed from an Atlanta data center. Before implementing Softricity's SoftGrid application virtualization platform, deploying a new application meant a business unit needed to buy three servers — one for the application, the second for redundancy and the third for testing. The application may only serve a handful of employees one-third of the day, but no matter, says Jonathan O'Brien, senior systems engineer for Lend Lease. It was imperative to keep each region's applications separated so that IT could make changes without affecting another region's ability to do business, he explains.

//Virtuous technology

As Warren Wilson, Summit Strategies analyst, spells out in a recent report, application virtualization can:

- Cut capital costs by enabling greater consolidation of IT resources.
- Cut operational costs by making IT systems easier and less expensive to manage.
- Free up resources for strategic initiatives.
- Speed deployment of new applications.
- Drive adoption of dynamic computing.

SOURCE "VIRTUAL APPLICATIONS: BOOSTER ROCKETS FOR DYNAMIC COMPUTING?"

As a result, Lend Lease's Citrix server farm took on monstrous proportions. At the peak, between June and October of 2004, IT maintained 80 servers, most of which sat idle two-thirds of the day, O'Brien says. The servers supported about 25 application suites, encompassing roughly 150 published applications, he adds. Since December 2004, when IT began the migration to application virtualization, it has cut the number of servers down to 15. Savings for the business units have racked up as they now share the server bill, he says.

"That's been the primary benefit — that we are able to pass on significant savings to the business units while running the same applications at or better than the performance level we were before," O'Brien says. "And the business units are now coming to us for more types of applications knowing that they aren't going to have to write a big check for three servers, plus the operating system, virus protection and more, he adds. "My phone just keeps on ringing." ■

On application virtualization, thin clients and grids

While Heartland Financial and Lend Lease use application virtualization, delineating between application virtualization and other technology approaches isn't always easy. Citrix professes to offer a virtualization-style model to deploying applications in a thin-client setup, for example. Meanwhile, grid vendors such as DataSynapse can provide virtualization-like capabilities for users by distributing application processing among various computers. Go online to read how two other enterprises are approaching their application management challenges using these technologies.
Go to www.nww.com, DocFinder: 1424

Spam continued from page 30

a busy server error for the rest. Legitimate mail servers will attempt to resend the mail, while a spammer's zombie typically will not. In this way, the mortgage spam is blocked, but the mortgage newsletter lands in the subscriber's inbox.

Pure junk

Even without an extremely aggressive configuration, reputation-service devices detect 60% to 75% of the spam at the gateway, dropping 30% to 40% of it outright, says Charlie Gautreaux, server administrator for Charlotte Pipe and Foundry in Charlotte, N.C.

Before letting CipherTrust's IronMail gateway appliance loose to kill spam, Gautreaux examined all the suspicious mail it quarantined then looked at the mail that was later forwarded. This helped him determine what reputation rating would generate the least false positives. It also gave him confidence that the mail with a high spam rating was junk and could be deleted.

CipherTrust "combines data from billions of messages per month and analyzes behavior attributes such as traffic data, whitelists, blacklists and network characteristics to determine each sender's reputation," Gautreaux says. "Reputation services is certainly a more intelligent way of fighting spam and one that will supercede standard dictionary and content-based filtering," he concludes. "This is particularly true as the volumes increase and the attack mechanisms become more sophisticated." ■

//A winning defense

Early adopters like spam-fighting reputation services for their ability to:

- Drop spam before it clogs the enterprise network, with very low false positive rates.
- Slow the rate of questionable messages accepted by the corporate e-mail server.
- Combat e-mail-borne viruses and worms.
- Do the job with little to no ongoing management.

Getting to the Core of Backup Problems

By eliminating network congestion, Force10 curbed the unpredictable backup times hurting this insurance firm's productivity.



"It was difficult to explain to our executive group that we couldn't reliably predict how long the backup would take."

Colin Hines
Senior Administrator of Network and Security Infrastructure at Tower Hill

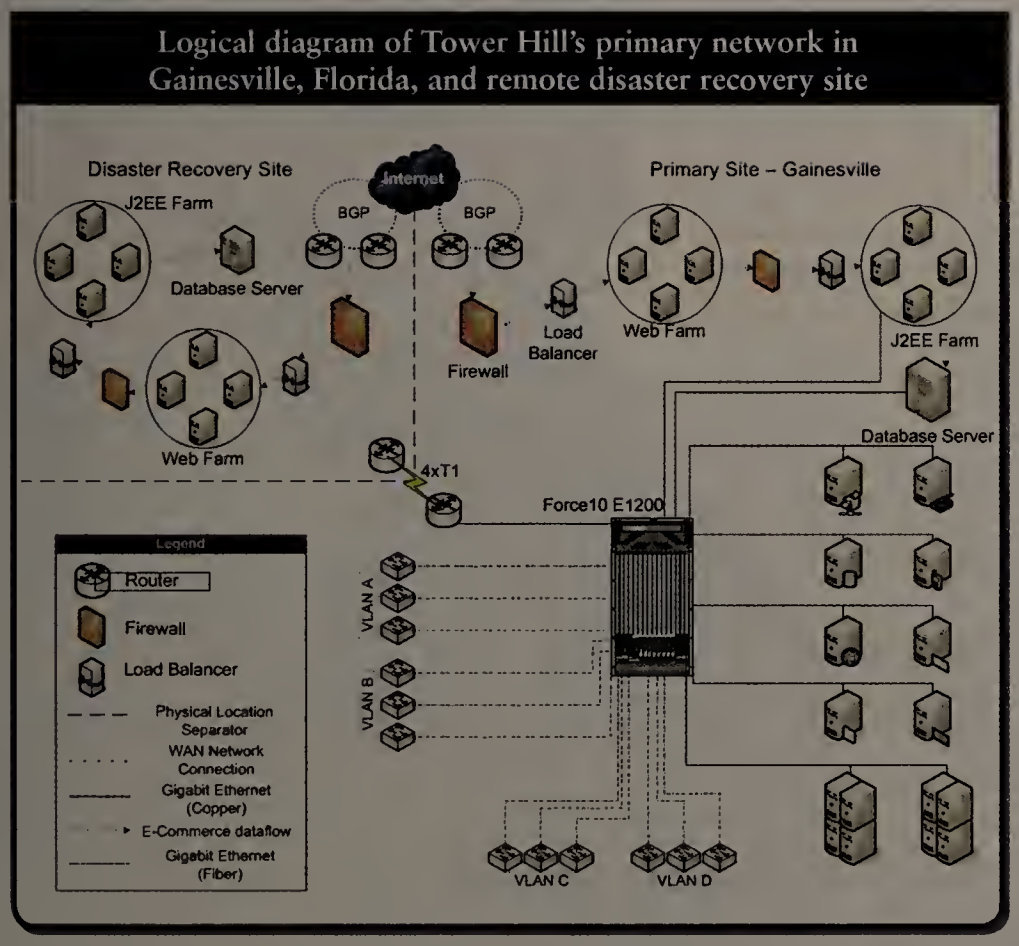
On those occasional nights when the backup process for Tower Hill Insurance Group's policy management application took a full 16 hours, employees arriving for work would find themselves locked out of the application. "No one could do anything," says Colin Hines, Tower Hill's Senior Administrator of network and security infrastructure. "It was difficult to explain to our executive group that we couldn't reliably predict how long the backup would take."

Based in Gainesville, Fla., and with offices in Kentucky, Tower Hill is a leading property and casualty insurer providing coverage for homes, rental properties, personal automobiles, and commercial property to 500,000 policy holders in Florida. The company has a Web-enabled IT and billing infrastructure that supports its 400 employees and enables it to attract new agents and cost effectively scale its business.

Each night Tower Hill backs up data relating to policies and claims – about 4 terabytes. With the total volume of company data doubling every two years and hitting 15 terabytes this year, the strain on the network began to show. In particular, the time needed to back up its business-critical policy management application became unpredictable.

To ensure data integrity, IT first backs up the application to capture daily changes, then runs an update process that inserts information such as policy renewal dates, and then backs up the application again. While the update process completed in a predictable timeframe, each backup took anywhere from four to seven hours. On average, the three-stage backup and update process required 13 hours. When backup times ran longer, employees arriving for work were locked out of the system.

Logical diagram of Tower Hill's primary network in Gainesville, Florida, and remote disaster recovery site



Ripple Effects

The network became the first thing the server group blamed for the varying backup times, Hines notes, since they could easily check out their equipment. Hines, on the other hand, was spending 25 to 30 percent of his time monitoring and troubleshooting the network, and finding work arounds to congestion problems. When he determined that the volume of data coming into blades on his two core routers was greater than the blades' connection to the routers' backplanes, he helped the server team work around the oversubscription problem by balancing where servers plugged into the network.

It bought them some time. But it meant Hines needed to direct the server team each time a new server was brought on line. The unpredictable backup times impacted IT in other ways, as well. Routine maintenance and software releases, for example, had to be done on weekends as it was impossible to do them at night.

With traffic volumes continuing to escalate, Hines knew something had to give. "Our core couldn't handle the amount of data we were pushing through it," he says. "And I want the network to be something you can just plug into and it goes." It was time to upgrade the network core.

Wanted: Performance and Reliability

When Hines began evaluating new core devices, he knew what he wanted. "We buy best in breed," he notes. "We needed line-rate throughput, non-blocking gigabit interfaces, and access lists. And we needed reliability."

Tower Hill's search for a new core router led them to Force10. Hines installed a Force10 TeraScale E1200 switch/router in early 2005 and has watched the combined time for both pre- and post-update backups of the policy management application drop to a consistent 2.5 hours. What used to be a 13 hour or more backup and update process is now routinely done in five.

"One of the really attractive things about the Force10 E1200 is that it's full rate line speed, non-blocking. It's not oversubscribed, as were other core switches I evaluated," says Hines. Each server now has true gigabit access to every other server and device on the network. In addition, the E1200 supports active redundant links with immediate failover if one link fails. As a result, each Tower Hill server with dual-gigabit interfaces has a 2-Gbps connection to the core whereas the previous core routers only supported one active connection in a dual-homed configuration.

In addition, the E1200 is a fully redundant system, ensuring continuous uptime for the network. And Hines has been impressed with the level of support Force10 provides. "We're a moderate-size business," he notes. "I've never had support this excellent."

Core Benefits

With a line-rate, congestion-free core switch/router in place, Tower Hill is assured of predictable performance from the network. As a result, backup times have been dramatically reduced, ensuring critical applications are always available during business hours and freeing IT staff to perform routine maintenance, software releases and other tasks in the evening rather than wait until weekends. IT's management overhead has also dropped, as the burden of ongoing network monitoring and troubleshooting has been eliminated.

"Force10 gave us the ability to exonerate the network," Hines says. Tower Hill now has a predictable network with plenty of headroom to accommodate ever increasing traffic loads.

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Continuous protection

Early adopters love the peace of mind they get with continuous data-protection tools.

By MICHELE HOPE

Mark Kash, an IT specialist with the U.S. Army Corps of Engineers, knows the joy of using technology to turn once-irritating hands-on jobs to hands-off, automated processes.

Charged with protecting more than 1,000 desktop computers at 55 remote sites associated with the Army Corps' Huntington District in West Virginia, Kash used to spend Saturday mornings checking the status of back-up jobs. But that chore became a thing of the past last year, when he began using Storactive's LiveBackup continuous data-protection (CDP) tool.

Kash switched to LiveBackup from a pricey back-up service that often caused remote client workstations to hang in the mornings while back-up jobs were running. Convincing management to make a one-time investment of $150,000 for the hardware and software required to run LiveBackup was a cinch when he compared the project cost with the roughly $540,000 the Corps would have spent on the outsourced back-up service over the next three years. "We were really able to do this without increasing the budget," he says.

Just as important, backing up 1,000 PCs is now virtually hands-off — a thrilling outcome, Kash says.

CDP products sit in the background and record any changes made to a specific file or to an application's underlying block-based data in real time, Kash explains. They're fueled by database applications that record ongoing changes made at the point of a user save or a database write request. This contrasts to legacy back-up software or newer, disk-based snapshot technology that backs up data sets from a specific point in time.

CDP comes as host-based software or combined in hardware/software products or appliances, such as the Continuous Protection System 1200 by Revivio, a 2005 start-up to watch (www.nww.com; DocFinder: 1422). Besides Revivio and Storactive, CDP vendors include start-ups Mendocino Software, TimeSpring Software and XOsoft, as well as mainstays EMC, HP, IBM, Microsoft and Network Appliance (through the acquisition of Alacritus).

Combining CDP and replication

As a young technology, CDP often isn't on an IT executive's wish list. But once discovered, many want it.

Such is the case at Evenson Best, a New York-based, furniture distributor and management company with 140 globe-trotting employees. After the Sept. 11, 2001, terrorist attacks, the Northeast power-grid failures and an explosion in his building, IT Director Martin Silverman knew he needed a way to keep Evenson Best's critical data and systems replicated off-site and available to employees no matter what was happening at headquarters.

While he was thinking about remote replication, he deployed a combination of that technology with the data-rewind CDP functionality. The combo comes in XOsoft's WANSyncHA software, which helps Silverman avoid replicating potentially corrupted data from one site to another. WANSyncHA solves this problem, he says, by recording specific checkpoints of changes stored in its database that can be used to identify the last-known good state of data before corruption.

"If our main facility ever goes dark, we now have an up-to-the-minute copy of our data," Silverman says.

Silverman has been using WANSyncHA for six months and says he's been pleased with the product's CDP functionality and the four self-tests it runs daily. If the testing uncovers a potential problem and there is a need to fail over to the remote server, the software will alert him.

Evenson Best's investment in WANSyncHA is an insurance policy to protect against something going wrong, Silverman says. If disaster strikes, it will pay for itself several times over. That type of assurance, he adds, is priceless.

Hope is a freelance writer who covers enterprise storage and network issues. She can be reached at mhope@thestoragewriter.com.

Got to have it

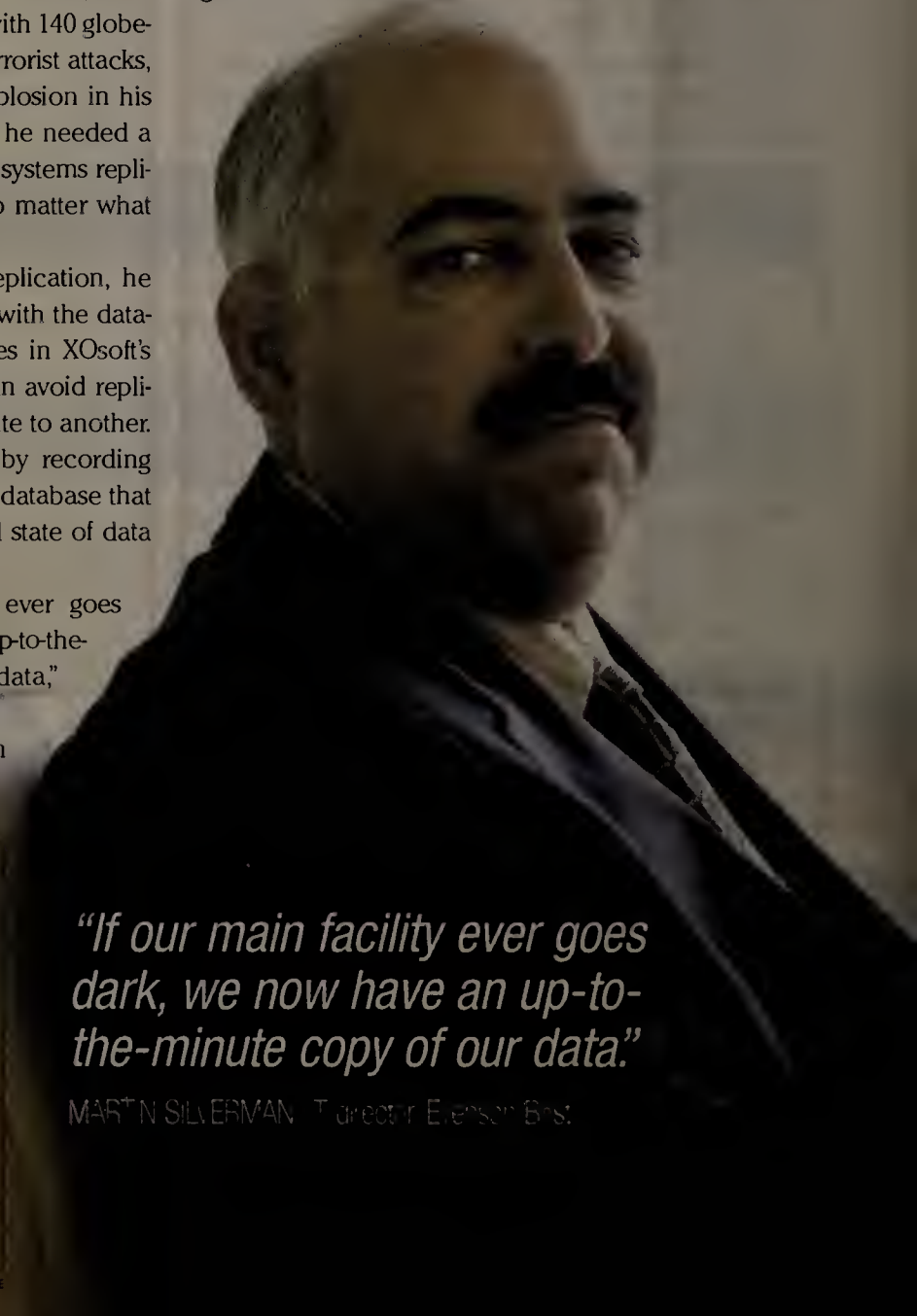
Find out what a difference continuous data protection has made for IT operations at K-Star, an IT service provider. **Go to www.nww.com, DocFinder: 1423.**

//CDP virtues

Corporate IT executives who have deployed CDP tools cite these advantages:

- Makes application data more available by eliminating the back-up window required by traditional back-up software.
- Offers one of the lowest recovery-point objectives for restores (up to the last file save or transaction).
- Allows rapid, disk-based system recovery or file recovery (also referred to as a low recovery-time objective).
- Reduces IT involvement in back-up/restore administration and troubleshooting.
- Can reduce IT support costs by offering user-driven file restores.

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POWER people

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//The Power 50
A look at 2005's most powerful people in networking begins at right.

//Power profiles
Meet five of the most powerful people in-depth:
- Microsoft's Kim Cameron, page 46
- VMware's Diane Greene, page 47
- Bank of America's Craig Hinkley, page 50
- Red Hat's Matthew Szulik, page 52
- Cisco's Jayshree Ullal, page 54

//Powerful influences
Four of the network industry's most powerful individuals tell us about the people who have inspired them. page 68

The 50 most powerful people in networking

This annual list of the 50 most powerful people in networking glorifies power in all its various forms. We honor the aggressive, the competitive, the colorful, the intelligent, the masterful and the thought-provoking. They are the people who make this industry so vibrant.

By JULIE BORT AND BETH SCHULTZ



POWER ELITE

• John Chambers // President and CEO, Cisco

Chambers spent 2005 on the prowl for Cisco's next growth market and found video — the last quadrant in networking's so-called quadruple play of data, wireless, voice and video. Video on the corporate net is an obvious move for a router and VoIP gear maker. IP video to consumers is less obvious, but Chambers has been talking that up too. He'd like Cisco gear to be as prevalent in the next-generation digital home as it is in the enterprise wiring closet. He's also pushing Cisco into young technologies such as self-healing security and IP push-to-talk. His typical confident self, Chambers reportedly told analysts in December that Cisco will continue to grow at 10% to 15% a year.

• Larry Ellison // CEO, Oracle

PeopleSoft, check. Retek, check. Siebel Systems, check. With his unwavering ability to set a long-term strategy for growth and his dogged determination to win a business battle, you get a CEO who resembles the Energizer Bunny — he keeps going and going (and growing and growing). And beyond the outright acquisitions comes the opportunity to win customers for Oracle's own products. For instance, both Retek and Siebel have been known for their strong integration with IBM's DB2. With Oracle now in charge, Ellison has two new crops of customers he can harvest. Even so, Ellison's most pressing enemy target is not IBM but SAP, Oracle's largest competitor in the enterprise application market.

• Bill Gates // Chairman and chief software architect, Microsoft

Gates doesn't have to do much to capture the limelight — a testament to his industry might. Most recently, all lights shone on Gates sharing his vision of how Internet software services will revolutionize the world. With Gates hailing the software-as-a-service concept, we can expect stepped-up development activity well beyond Redmond. Software and services competitors as well as entrepreneurs will look to angle in on this Bill-blessed market.

• Sam Palmisano // Chairman and CEO, IBM

Palmisano leads the world's largest network-industry company, No. 1 on the Network World 200, with 2004 revenue of $96 billion. In '05 he pushed the company toward small and midsize enterprise projects (though not by forgoing high-end implementations). With these targets in mind, he bought application service provider Corio and open source middleware maker GlueCode. Palmisano says he's focused on keeping IBM's wares from the perils of the commodity drainpipe and the revenue sinkhole caused by commoditization. He's doing so by creating a menu that stretches from free, à la carte offerings to classic supercomputers and multimillion-dollar outsourcing deals.

• Joe Tucci // Chairman, president and CEO, EMC

In his five years as CEO, the straight-shooting Tucci has been recrafting EMC into one of the industry's mega players. In its '05 third-quarter earnings report, EMC showcased nine consecutive quarters of double-digit growth. Alongside that happy news, EMC's board handed Tucci the chairman position, which takes effect Jan. 1, 2006. Tucci envisions expanding EMC beyond enterprise storage into a systems management company, as demonstrated by his smart, hands-off approach to the ever more-successful VMware and his acquisition of network management vendor Smarts.

• Ivan Seidenberg // Chairman and CEO, Verizon

In 2005, Seidenberg set himself on a big power trip — an $8.4 billion adventure that would land him atop a mountain of a communications services provider with annual revenue of more than $90 billion. As the year closed, he waited on clearance from several states so he could call MCI his own. But the true test of his power will come in '06 as he integrates the two companies. If successful, he'll launch Verizon into a secure future framed by coveted broadband, wireless, advanced IP and business services.

• Edward Whitacre // Chairman and CEO, the new AT&T

Whether you think SBC/AT&T a foolish lark or a masterful move, you've got to admit the guy's got gumption. Orchestrating the $16 billion acquisition of an American icon — tarnished though it was — took guts, no matter how you look at it. Whitacre sees a big payoff in cost reductions, scale and the all-important enterprise customer base. But like Verizon's Seidenberg, the biggest test of his power will come in integration and next-generation strategizing.

ENTERPRISE COMPUTING

• Steve Ballmer // CEO, Microsoft

Security, development snafus with Windows Vista, the Linux threat — Ballmer had much to pour his energies into in '05. But it took Google to set Ballmer into a full roar. Call him territorial, but he just doesn't like upstart search companies encroaching on technology areas Microsoft has staked out or trying to convince his employees to leave Redmond behind for Mountain View's greener pastures. His dander raised, Ballmer is more determined than ever to win the Web. On his watch, look for Windows developers to begin building applications that deliver software programs over the Internet and that bridge the desktop environment and the Internet.

• Ian Foster // Co-founder, chief open source strategist and board member, Univa

Foster pops to mind when you think about people powering the grid movement. He has long promoted the notion of open source grid technology, a dream he turned into reality with the Globus tool kit and, in mid-2004, the formation of Univa to provide enterprise-class grid software and services. In 2005, Foster did his title proud, strategizing Univa's way into a deal that has IBM providing product development resources, technology assets and more.

• Diane Greene // Co-founder and president, VMware

With the industry abuzz over virtualization, the unassuming Greene finds herself thrust into the spotlight. The VMware technology has become synonymous with server virtualization, and VMware as a company (now an independent operating unit of EMC) is a case study in business

People continued on page 40



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excellence. VMware is expected to clear as much as $400 million in revenue for '05, with the number of customers reaching 20,000. Look for Greene to exercise her power next year as she strives to proliferate the VMware platform and create a virtualization ecosystem. (See in-depth profile, page 47.)

• Mark Hurd // President and CEO, HP

Not yet a year into his tenure as top honcho, Hurd has much to prove regarding his power to make HP a more competitive, smarter business. Certainly "doubling-down" in the server, storage and management software businesses, as Hurd has said he will do, is a good start to gaining power in the enterprise market. The same goes for improving customer service and getting the company's cost structure in line, two more of his top strategic initiatives.

• Scott McNealy // Chairman and CEO, Sun

McNealy grabbed his share of the limelight in 2005 with the splashy StorageTek and SeeBeyond acquisitions. Noteworthy is that Sun is sitting on a whole lot of cash — $4.5 billion — and McNealy has hinted he'll continue shopping in 2006 as he attempts to grab a piece of the nascent service-oriented architecture market and the new enterprise applications it will spawn. In '05, McNealy also celebrated the 10th anniversary of Java, a not-so-subtle reminder of how long he has been pushing the industry toward a modularized, open source applications model. A buzz-generating joint marketing agreement between Google and Sun indicates that McNealy may have finally found a partner with the kind of distribution pull needed to take on his longtime operating system rival, Microsoft.

• Paul Otellini // President and CEO, Intel

For Otellini, you might say power is all about wattage. That is, Otellini intends to stave off competitive thrusts and keep Intel at the forefront of the microprocessor business with a new chip-design architecture intended to deliver the best performance per watt of power consumed. Showcasing Intel's best, the new chips will be 64-bit capable and come with virtualization, LaGrande security technology and Active Management Technology. On the business side, Otellini racked up big power points when he secured a deal with Apple, which will now use Intel chips in its Macintosh computers rather than the IBM PowerPC chips to which it had been committed for 10 years running.

• Kevin Rollins // President and CEO, Dell

Despite hiccups in Dell quarterly revenue in '05, Rollins remains his calm, cool and collected self. With unflagging confidence, in November he told MBA students at Peking University that he wasn't backing off his $56 billion annual revenue expectation. Also clear from other public statements is Rollins' commitment to getting Dell to the $80 billion mark, perhaps not by 2009 as he once insisted, but at some point in the foreseeable future. Success selling new high-end PCs — a strategy some equate to Toyota creating the Lexus brand — will be critical to boosting the bottom line. Less attention-grabbing, but still notable, are continued improvements in Dell's enterprise line, such as the new, dual-core PowerEdge database servers.

• Hector Ruiz // Chairman, president and CEO, Advanced Micro Devices

What a year it's been for Ruiz since he made his debut on the '04 Power 50 list. His face has graced the cover of *BusinessWeek* as one of the best managers of the year, and *Fortune* magazine named him one of the most influential Latinos in business. The accolades are well deserved, as Ruiz continues finessing growth and garnering respect for this small but increasingly mighty chip maker. One testament to that: In the third quarter, AMD chalked up $1 billion in sales for the first time. As 2006 unfolds, Ruiz is sure to keep up the good fight — whether in a courtroom antitrust hearing, in AMD's R&D labs or out on the Street.

• Matthew Szulik // CEO, Red Hat

Day in and day out, Szulik delivers the message that collaborative software development has power like nothing else. He's also delivered what many thought impossible — profitability in the open source world. Because of that, his power has grown immensely in 2005. Many vendor CEOs say they are forced into cuddling up to Szulik just to have a stake in the open source world. But Szulik doesn't take himself that seriously. At the Red Hat Summit he took the stage with a gospel choir. As he said in a later interview: "So to see a white guy up there with an African-American gospel choir should send a message to people about the importance of community." (See in-depth profile, page 52.)

• Daniel Warmenhoven // CEO and director, Network Appliance

You might call Warmenhoven a quiet giant. The low-key CEO has built NetApp into a billion-dollar-plus vendor for enterprise network storage while cultivating a corporate culture of trust and integrity. In late 2004, such achievements earned Warmenhoven recognition as Ernst & Young Entrepreneur of the Year in the technology sector. But Warmenhoven is not averse to aggressive strategizing, either. He showed that in the April '05 decision giving IBM the OK to brand and resell NetApp gear. Though some industry watchers fear the move could negatively impact the company in the long term — creating brand confusion, for example — for now it's a smart deal that helps better position Warmenhoven to do battle against EMC.

NET INFRASTRUCTURE

• Charlie Giancarlo // Senior vice president and chief development officer, Cisco

This longtime Cisco star shot up even further in 2005 with yet another title added to his business card. He became chief development officer, taking over the top engineering role when Mario Mazzola retired in mid-summer. Giancarlo now oversees some 14,000 engineers, whom he'll no doubt charge with finding a product mix to make good on CEO John Chambers' promises of double-digit growth, particularly in video. Elsewhere, Giancarlo has been talking up the network's role in security and promising to deliver on another of Cisco's latest thrusts, the real-time, application-aware network.

• Scott Kriens // CEO, Juniper Networks

During an October conference call, Kriens made light of the fact that enterprise product sales were up 17% quarter over quarter. "For a company looking to get into the enterprise, three-quarters of a billion dollars in business is not bad," he quipped. In all seriousness, Kriens has earned bragging rights this year for increasing enterprise sales of security and application-acceleration gear.



• John McHugh // Vice president and general manager, HP ProCurve Networking

In '05, McHugh was everywhere, his presence requested at a variety of industry conferences. In mid-December, for example, he participated in an Interop Town Hall panel addressing the most important technologies for 2006. The desire for his insights is well warranted. He has led ProCurve into the No. 2 position in the Ethernet switch market, based on worldwide port shipments, according to Dell'Oro Group. McHugh wins kudos for his well-rounded enterprise strategy, which encompasses convergence, wireless LANs, WAN access and more.

• Don Peterson // Chairman and CEO, Avaya

Thanks to Peterson's laser-like focus on Avaya's market niche — enterprise convergence gear — the company leads the market in various forms of IP telephony, according to multiple market research firms. With the recent acquisition of Nimcat Networks, a maker of peer-to-peer IP communications software, Peterson also has validated serverless VoIP. Peterson plans to integrate peer-to-peer phones with Avaya's other enterprise wares and use this product to push into the small and midsize business space. Watch for Peterson to move Avaya into advanced telephony tools, such as context-aware apps, speech and wireless, all key areas for the company's 2,000 researchers.

• Greg Raleigh // President and CEO, Airgo Networks

Raleigh's baby, the Multiple-Input, Multiple-Output (MIMO) spec, has been called the most important wireless technology in the works. MIMO uses multiple transmitting and receiving antennas to broadcast signals faster and with more depth than traditional wireless antennas. As Raleigh awaits IEEE standardization for MIMO, he forges ahead with Airgo. Airgo also has been making waves, with wireless vendors lining up to embed the MIMO chipset in their wares.

• Mark Spencer // President, Digium

At 27, Spencer has the youth and momentum to set the network industry spinning. He became famous in 2005, as the industry took notice of Asterisk, the open source PBX system he created, and of his continued pioneering work in open source telephony. Not only is Asterisk an intriguing open source option for VoIP, but as an open source hardware product it has become the proving ground for the entire open source movement. Spencer has been as admired for his marketing skill as for his technical abilities.

• Jayshree Ullal // Senior vice president, Data Center, Switching and Security Technology Group, Cisco

As part of its July reorganization, Cisco top management testified to Ullal's power when it topped off her security responsibilities with storage and switching too. Ullal now oversees a business unit whose products represent almost half of the company's quarterly revenue, on average. (See in-depth profile, page 54.)

• John Williams // Director, Auto-ID lab at the Massachusetts Institute of Technology

When researchers at the Auto-ID lab at MIT talk about RFID technology, everyone listens. When Williams became the lab's director in April, one of his first missions was to launch an initiative to build a simulation of the EPCglobal Network. This came at the request of EPCglobal, a nonprofit clearinghouse of RFID information and standards-setting organization. Williams' project will study and model how RFID information flows within an enterprise and its supply chain. Williams also directs MIT's Intelligent Engineering Systems Lab, and is a recognized authority on large-scale simulations. Currently he's studying grid and agent technology to simulate the nation's critical information systems.

ENTERPRISE NETWORK EXECUTIVES

• David Barnes // Senior vice president and CIO, United Parcel Service

The CIO on Barnes' nameplate is new this year, but certainly not the business savvy and technology know-how that warrants such a title. A nearly 30-year company veteran, Barnes knows UPS' IT needs like nobody else. Now he has direct control of the company's $1 billion IT budget and the chance to set corporate strategy as a member of the UPS Management Committee. In his inaugural year as CIO, Barnes has focused on rolling out a next-generation driver terminal featuring built-in cellular, wireless LAN and Bluetooth systems.

• Gordon Bither // Senior vice president, integrated network solutions, State Street

Don't denigrate managed services to Bither, an outspoken advocate of offloading routine network tasks to carriers so enterprise network architects can free their time for real business problems. Bither has handed over management of this institutional investment giant's new, state-of-the-art global WAN — an MPLS architecture — to AT&T and MCI. In his tenure, Bither and his technology team have improved service-delivery quality by 33% and increased productivity by 68%. His message for fellow network executives is that, if you can't make managed services work you're not going to remain competitive.

• Robert Carter // Executive vice president and CIO, FedEx

Carter may not be as easily recognizable as the purple-and-orange FedEx corporate logo to the average American Joe. But his name and face are icons among the IT crowd. In '05, he crisscrossed the globe sharing his insight into such hot topics as business intelligence and IT transformation. Carter's words carry considerable weight, coming as they do from his experience transforming IT at the $27 billion company over the last three years. He is candid and articulate — characteristics welcomed by peers grappling with IT transformations of their own.

• Lt. Gen. Charles Croom // Director, Defense Information Systems Agency

Handling IT for the president on down in the Department of Defense chain of command calls for someone marked by steadiness. Since assuming the DISA mantle in July, Croom has been that guy. He's reassessed the agency's multibillion Net-Centric Enterprise Services program, aimed at providing a secure, collaborative information-sharing environment among Defense Department constituents. In his approach to DISA projects such as this, Croom has made his stance clear: Do not reinvent the wheel for the sake of ownership; collaborate and share where possible. Powerful thoughts indeed.

• Steve Elterich // President and CIO, Fidelity Investment Systems

Two billion dollars makes a whole lot of greenbacks, all at Elterich's disposal for IT spending at the largest U.S. mutual-fund provider and leading online brokerage. So what does



one of the country's most senior-level enterprise technologists have on his power agenda for '06? As you might expect, better aligning IT to the business, with the twin goals of ensuring competitive advantage and enhancing customer service. Business services management, convergence, open source — these are a few of the technologies Fidelity Investments has tapped for getting there.

• Craig Hinkley // Senior vice president and manager of strategy, architecture and security for enterprise access and desktop services, Bank of America

As architect of a 180,000 VoIP handset rollout — perhaps the world's largest — this native Australian is the biggest boomerang around when it comes to convergence. Although Bank of America's IP voice calls will traverse a Cisco network, Hinkley hasn't ruled out other vendors — including start-ups — for whatever down-the-road advanced functionality he deigns necessary. Apparently he believes in spreading the power. (See in-depth profile, page 50.)

• Dianah Neff // CIO, city of Philadelphia

Neff's battle (largely against Verizon) to bring a high-speed meshed wireless network to Philadelphia was one of the industry's most fascinating dramas in 2005. In a contract eventually handed to Earthlink to build and manage this network, Neff set up a model of citywide wireless access that's similar to cities' model for cable TV. Thanks to Neff, Internet access has become an official city utility (see related story, page 62.)

• John Partridge // President and CEO, Inovant, the global IT arm of Visa

Visa's technology visionary, Partridge leads an executive team of six technologists and heads a 25-person business operating committee that funds and builds all technology initiatives at Visa. He oversees decisions about VisaNet, which clears and settles transactions from $1 trillion worth of annual sales. He creates, runs and manages such services as dispute resolution tools and rewards systems for 21,000 Visa member banks. And he is the top gun for new application development. A major '05 accomplishment was the opening of a state-of-the-art data center for VisaNet. Partridge is everywhere Visa wants to be.

• Peter Quinn // CIO, commonwealth of Massachusetts

Quinn launched the commonwealth's IT strategy into the public eye this fall when he mandated that documents be stored in the XML-based Open Document Format (ODF), a decision that took on additional significance when Microsoft, which doesn't support ODF, went on the offensive. But in December, Quinn made the word processing giant bend at the knee — Microsoft announced that it would add ODF support to meet the state's mandate. In taking on Microsoft, Quinn has become a hero to open-standards advocates.

• Fred Wettling // Manager of technology strategy, Bechtel

In a company of 40,000 employees, Wettling numbers among 18 Bechtel Fellows, a distinction he received last fall, when the $17 billion global contracting company honored him for his outstanding technology contributions. Lately that has meant Wettling's outspoken advocacy of the oft-maligned IPv6. Believing the next-generation protocol is a business imperative for security and access, Wettling spread the word throughout Bechtel and got the executive nod to begin a three-year migration project. No doubt Wettling will share his experiences. He is chairman of the Network Applications Consortium, and holds membership on the North American IPv6 Task Force, North American IPv6 Business Council and Cisco's enterprise and federal technical advisory boards.

ENTERPRISE APPS

• Shai Agassi // Executive board member, SAP

Agassi ended 2005 in a new enterprise-application landscape, with PeopleSoft and Siebel Systems subsumed under his major competitor, Oracle. But Agassi was ready — he has been remaking SAP into a more nimble company for years. At SAP TechEd in September, Agassi said he believes most enterprises are already in the "post-chasm" phase of adopting the service-oriented architecture, with SAP positioned to lead the market. He predicts 30% of SAP's customer base will soon be using the NetWeaver SOA platform, his baby.

• Marc Benioff // Chairman and CEO, Salesforce.com

Benioff, the outspoken leader for the application services provider model, pulled off a coup against Oracle when he brought PeopleSoft's ex-CEO, Craig Conway, to the Salesforce.com board in October. Not that Benioff needs a lot of help. Salesforce.com is expected to report over $300 million in revenue for fiscal 2006, which ends in January, up from $176 million in fiscal 2005. Net income also doubled in fiscal 2006, to $7.3 million. Benioff reportedly eagerly awaits the Oracle/Siebel deal, ready to snag disenchanted Siebel customers. Benioff's industry stature continues to grow. He was named one of the top 15 innovators in the last 15 years at *Network World*'s Demo conference.

• Alfred Chuang // Founder, chairman and CEO, BEA Systems

Chuang has had a bustling year, continuing to stockpile his company's offerings in the application-services infrastructure market. Perhaps his biggest move was the summer acquisition of portal competitor Plumtree. Others were a telco-industry convergence platform, a next-generation JavaBeans presence engine and RFID middleware technology. Besides shopping for new technology, Chuang also proselytized BEA's next-generation brand, AquaLogic, which does what he calls SOA life-cycle management.

• Steve Mills // Senior vice president and group executive, Software Group, IBM

In 2005, IBM established itself as an open source player, giving Mills the responsibility for executing its strategy and somehow do it profitably. Not to worry — under Mills' direction, IBM raked in $15.1 billion in software revenue in fiscal 2004, which made Mills' group the No. 1 software maker worldwide, IDC says. Mills plans on using a classic loss-leader strategy to convert IBM's considerable 2005 investments in open source initiatives and acquisitions — for example, its purchase of open source player GlueCode — into revenue and profit. He'll reel 'em in with the free stuff, then happily convert them to paying customers.

• John Swainson // President and CEO, CA

Swainson, who learned the ropes as a 26-year IBM veteran, officially climbed into the top spot at the $35 billion software maker in February, after spending three months as CEO-elect. His appointment as CEO is a good omen for CA; his first plan of action is a complete overhaul of CA's corporate culture. Intent on fixing the company's dismal reputation for customer service, he has reorganized its executive management and changed the corporate name from the bulky Computer Associates International to the pithier CA. Swainson isn't press-shy, making himself as visible as possible while he orchestrates new product launches and woos customers.

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• Eric Schmidt // Chairman and CEO, Google

Schmidt's steering of Google has been so on-course in 2005 that his longtime rival — Microsoft CEO Steve Ballmer — reportedly threw a violent tantrum in reaction to his successful recruiting of Microsoft employees. Microsoft also launched its own search engine in self-defense against Google — and the yearlong buzz that Google could be the one to topple Microsoft's PC interface monopoly. Making Microsoft jump is power in Schmidt's hands.

NETWORK SECURITY

• Kim Cameron // Chief architect of identity and access, Microsoft

Cameron has galvanized the industry into a discussion of digital identity with his Seven Laws of Identity. In addition, he has wired together a virtual who's who as part of an everyone-invited effort to define the science of identity and its application to computing. The list includes his boss Bill Gates, open source leaders, Microsoft-bashers and academics. (See in-depth profile, page 46.)

• Eva Chen // Co-founder and CEO, Trend Micro

In the year since taking over for her brother-in-law as CEO, Chen has moved decisively into emerging markets. Chen took on mobile phones with security software for Symbian operating system smart phones (such as Nokia). She attacked spyware in the enterprise with new products and pushed into anti-spam reputation services, making the latter move through the acquisition of Kelkea. She also partnered with wireless-router maker Netgear to beef up Trend Micro's presence in consumer markets. She did lose some face (and about $18 million) when Trend Micro released a buggy anti-virus update, but the company rebounded quickly from the costly gaff.

• George Samenuk // Chairman and CEO, McAfee

Samenuk has realized he doesn't have to expend energy in head-to-head combat with competitors such as Symantec. With a little creative thinking and strong products, he is reaching enterprise and consumer customers in new ways — and having financial success at it. For example, the relationship he struck with AOL to sell McAfee anti-virus and e-mail security wares has become a model for other service providers and is leading to unusual enterprise-customer wins, Samenuk says. He points to an agreement with Canada's ScotiaBank in which the bank will sell McAfee services to its online banking customers. He's also pushing McAfee with other clients, for instance, partnering with USB maker M-Systems to bring anti-virus technology to memory devices.

• Gil Shwed // Founder, chairman and CEO, Check Point

In 2005, a maturing Shwed has steered his venerable firewall company in directions that bode well for both himself and the company. Among his top '05 moves was the purchase of open source intrusion-detection system Sourcefire. Although Shwed is vague about how he plans on integrating Sourcefire with Check Point products, most analysts say the technologies dovetail nicely. Shwed promises to keep open Snort, the popular Sourcefire tool. He's moving into the desktop too, acquiring Zone Labs for its endpoint security technology. And Shwed has countered encroaching hardware vendors by rolling out appliances broadened to include protection of Web and LAN traffic.

• Paul Simmonds // Co-founder of the Jericho Forum; director of global information security, ICI

As one of the users who founded an industry consortium, Simmonds' influence is powerful indeed. His untiring energy has opened communication channels among international users to create next-generation security infrastructures in a no-perimeter world. Simmonds has attracted a who's who of global enterprises onto his governing board, including BP and Procter & Gamble. Its member roster of more than 50 end users is no less impressive. In 2005 Jericho completed a vision statement and began the technical, committee work to turn vision into standards. Simmonds also has been busy reaching out beyond the global biggies. At a Black Hat security conference, for instance, he organized a contest for papers that further the no-perimeters concept.

• John Thompson // Chairman and CEO, Symantec

Thompson packs a punch with his pitch that Symantec and other security companies have to expand into areas such as storage and systems management to remain relevant. Some industry watchers may doubt his strategy, but he has certainly drawn attention with his plans to move Symantec beyond security and into data-storage management, via the Veritas acquisition. Non-security vendors — think Microsoft in particular — trying to move into Symantec's home court won't have an easy time against the man and his vision.

SERVICE PROVIDERS

• Jeffrey Citron // Chairman and CEO, Vonage

With rival Skype now part of eBay, all eyes are on Citron and where he will take Vonage next. One place he's not afraid to go is to the regulators. Taking a page out of the Baby Bell playbook, Citron complained to the FCC after discovering that an ISP allegedly was deliberately blocking Vonage calls. Another area of regulatory dispute has been Vonage's E911 capabilities. The company has been under pressure by states to improve its 911 services — which the company required subscribers to activate separately from the phone service. In October, Vonage announced that it would implement Covergence's Eclipse E911 system to address the criticism; its ability to do so bodes well for other VoIP providers. Earlier this month it announced that basic 911 service was available to all customers, and the trickier E911 — where emergency teams learn the physical address of the caller — was available at 900 emergency call centers and quickly expanding. With such issues addressed, rumors are flying as to whether Citron will take Vonage public or find a deep-pocketed suitor of his own.

• Gary Forsee // CEO and president, Sprint Nextel

When Hurricane Katrina devastated the Gulf Coast region shortly after Forsee assumed leadership of the newly merged Sprint Nextel, he may have felt more powerless than powerful during what should have been his moment of glory. But the generous response that Forsee oversaw at Sprint Nextel was powerful indeed: As of mid-September, the company had donated $6.5 million in relief, distributing wireless phones, pre-paid phone cards, meals and cash contributions. Now Forsee has turned his focus on issues such as wireless adoption for businesses, integrating VoIP and wireless, and IP migration. He'll be a force — like Katrina — with which other carriers must reckon.

• Kevin Martin // Chairman, Federal Communications Commission

Martin's first year as FCC head was a cakewalk for him, as he pushed through several major initiatives with little opposition. He gave the nod for the Verizon/MCI and SBC/AT&T mergers, voted to end regulations requiring incumbent carriers to share DSL connections with competitors, and persuaded the FCC to require Internet carriers to tighten up their emergency services. Look for bigger tests of his power to come, however, as Martin undertakes IP services regulation and other more controversial issues in '06. ■



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Identity's

Kim Cameron, chief architect of identity and access at Microsoft, has galvanized an industry behind his Seven Laws of Identity.

By JOHN FONTANA

Kim Cameron isn't on a mission from God, but he once played guitar with some guys who were.

As a 20-something in the mid-1970s and the guitarist for Limbo Springs, a band he formed with friends, Cameron played at Toronto's exclusive Cheetah Club behind such luminaries as John Belushi and Dan Ackroyd, aka the Blues Brothers. While those two later starred in a same-named movie in which they proclaimed their mission was blessed by the Almighty, Cameron's future was guided by an electronic deity, the microcomputer.

Today, the 57-year-old Cameron, who admits to a lingering addiction to music played at ear-splitting volumes, heads all things identity at Microsoft.

In 2005, he galvanized the industry around a discussion of digital identity with his publication of "Seven Laws of Identity." Cameron has wired together a virtual who's who as part of an everyone-invited effort to define the science of identity and how to apply it to computing. The list includes his boss Bill Gates, open source leaders, Microsoft bashers and academics such as legal scholar Lawrence Lessig.

"To me, it is clear that all their interests must be served for progress to be made. There is so much distrust across the industry. I try to keep away from any kind of ideology and aim right at what can happen," Cameron says. Two things he learned with Limbo Springs, communication skills and the ability to dodge flying beer bottles, have helped him pull people together and deal with the instantaneous and often abrupt feedback of today's blogosphere, Cameron says.

Putting anything together, or more accurately putting anything back together, has not always been Cameron's forte. As a boy who grew up all over Canada following a father who was an officer in the Royal Canadian Navy, Cameron was fascinated with disassembling electronics. "I had this little weirdness. I liked to invent machines. I scavenged old radios and televisions and made transmitters and things," says Cameron, whose ever-present chuckle signals that he takes himself less seriously than he does his work.

Despite hating arithmetic, Cameron graduated from King's College, Dalhousie University in Halifax, Nova Scotia, with a bachelor's degree in physics and math at the age of 19. "I loved slide rules — the first computers I saw. They used to fascinate me, since I could then do physics largely without arithmetic," Cameron says.

He immediately dove into work on his master's degree in physics, gained unfettered late-night access to the school's mainframe and became one of the first teenage hackers at a time when computers were a mystery. "No one knew what I was doing and if I told them they ran away," he says.

But it was the late 1960s, and a love interest led Cameron from geekdom to philosophy, which landed him at the University of Paris. In 1970, he entered Montreal University, where he worked on a doctorate thesis around computer simulations of social phenomena. He also lectured at the university and two others. But mainframe access was difficult, so Cameron hooked up with Limbo Springs to recapture the teenage years lost to his studies.

After a few years touring, Limbo Springs settled in as the house band at the Cheetah Club. Eventually lured away by the microcomputer, Cameron was soon running the academic computing center at George Brown University, Canada's largest community college.

Cameron's identity fascination was born in 1984, when he realized a directory was needed for an e-mail platform he and a colleague were developing. They dropped e-mail, then pioneered and defined a metadirectory, called Zoomit. They sold the company in 1999 to Microsoft. "I believed Microsoft would be the best company to deliver the identity infrastructure. It's taking a while, but I still think it will happen," he says.

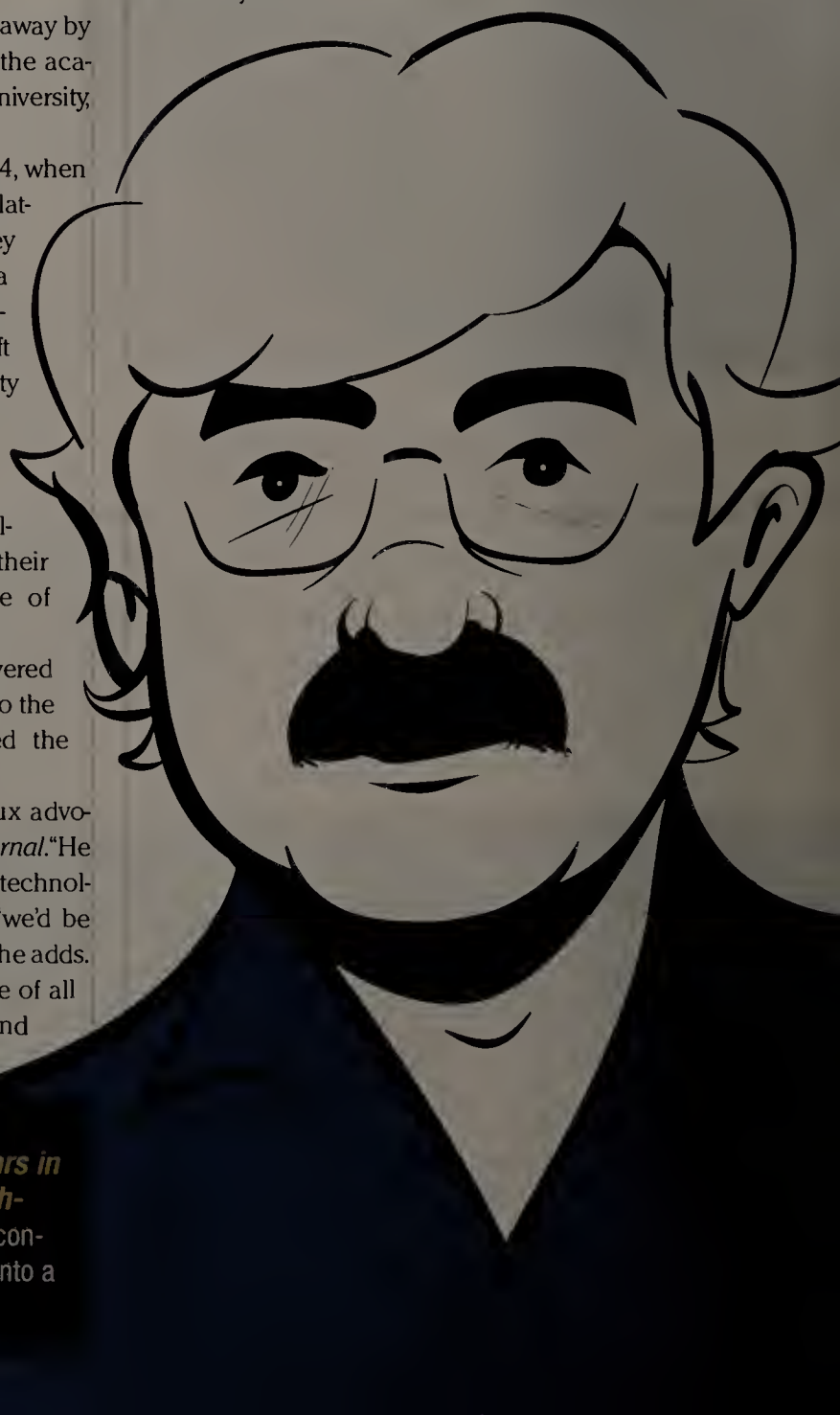
Cameron's busy making it happen. In 2003, he quietly went public with a technology he developed called InfoCard, which lets users control their identity information and is now a cornerstone of Microsoft's identity strategy.

In May 2005, his "Seven Laws of Identity," delivered with Cameron's knack for turning the complex into the understandable, was the lighthouse that guided the industry to the shores of meaningful progress.

"Kim is the great includer," says Doc Searls, Linux advocate, prolific blogger and senior editor at *Linux Journal*. "He is equally brilliant and engaging — first-rate as a technologist and as a human being." Without Cameron "we'd be years away from where we got just in the last year," he adds.

Cameron's own identity is one marked by a love of all types of music and cooking, especially complicated dishes that absorb his attention and relax him. Being a father has helped teach him patience — a trait that has been invaluable in his identity work through the years, he says.

Although he often wakes at 4 a.m. to work, he doesn't classify it as a chore. "For me, this isn't work," says Cameron, who takes several hours each day just to read and think. "I once asked an artist friend how he could just keep painting and painting. He just said, 'I'm an artist, so I paint.' It's like that. I just do what I do."



ANTONY HARE

//VitalStats

Position: Identity architect, Microsoft ***Age:*** 57 ***Years at company:*** Six ***Years in industry:*** A lifetime ***Major career accomplishment:*** Has galvanized a diverse group of often contentious technologists, vendors and academics into a meaningful discussion around digital identity.

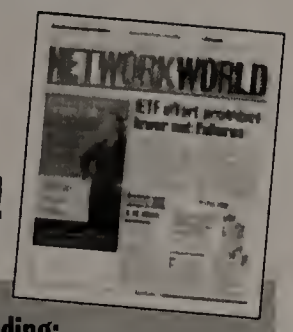
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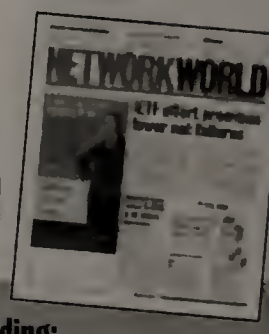
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The humble executive

Unassuming as she is, VMware head Diane Greene is revolutionizing the systems business.

By DENI CONNOR

Diane Greene is nothing if not unassuming and humble. She hates talking about herself and won't reveal any details about her family. But she will talk about her passions: VMware, the server-virtualization company she heads that EMC acquired in 2003, sailing, windsurfing and backcountry skiing.

Greene was raised in Annapolis, Md., by an engineer father and a schoolteacher mother. "Our house was on the water, and I had tremendous freedom," Greene says. "From a very early age, we could go [boating] with our friends, and crabbing, sailing and ice skating."

She recalls her first paying job — catching crabs for $5 a dozen from the piers lining the Annapolis shore. "You get in a boat, the crabs attach to pilings along the shore, you sneak up behind them and pick them up," Greene describes. "You need to be sure that you don't let them bite you. Then you dump them out into whatever you are keeping them in and sort them by size."

Greene, who loves the sound of the ocean, finds much of her inspiration from the sea.

That engineering and love of the water are in her blood shows in Greene's educational and career choices. After obtaining a bachelor's degree in mechanical engineering and a master's degree in naval architecture from MIT, Greene took her first official post-college job designing offshore oil rigs. She then traveled to Hawaii to design windsurfing gear. From there, Greene returned to the University of California, Berkeley for a master's degree in computer science. Being away from the sea and locked in academia didn't deter her — though Greene doesn't speak of them, there are stories of her hunting for treasure off a sunken Spanish galleon.

Then high-tech called, and Greene held a succession of jobs at Sybase, Silicon Graphics and Tandem before founding streaming-media company Vxtreme in 1997. After selling Vxtreme to Microsoft in 1997 for approximately $75 million, Greene cofounded VMware with her husband, Mendel Rosenblum, and two others. Greene served as chairperson and CEO until its acquisition by EMC.

Leading VMware is an important part of Greene's life, though a part that she clearly separates from her life at home.

"I have pretty set rules that I go home for dinner every night unless I am traveling," Greene says. "I have a lot of help to do chores so I can be with my family, and I never have any help over the weekends."

With her family, Greene regularly sails a 31-foot trimaran — a three-hulled, oceangoing sailboat — and skis the backcountry. She enjoys locations as remote as Montana and as exotic as the tropics.

In 1976 she won the women's National Double-handed Dinghy Championship, and won the women's division in the San Francisco Classic, a long-distance windsurfing race, three times. She also organized two windsurfing championships — the first Windsurfing World Championship in 1974 and the first windsurfing Olympics in Kingston, Ontario, Canada.

Her corporate leadership style is much the same as her leadership style when she's skippering a racing vessel.

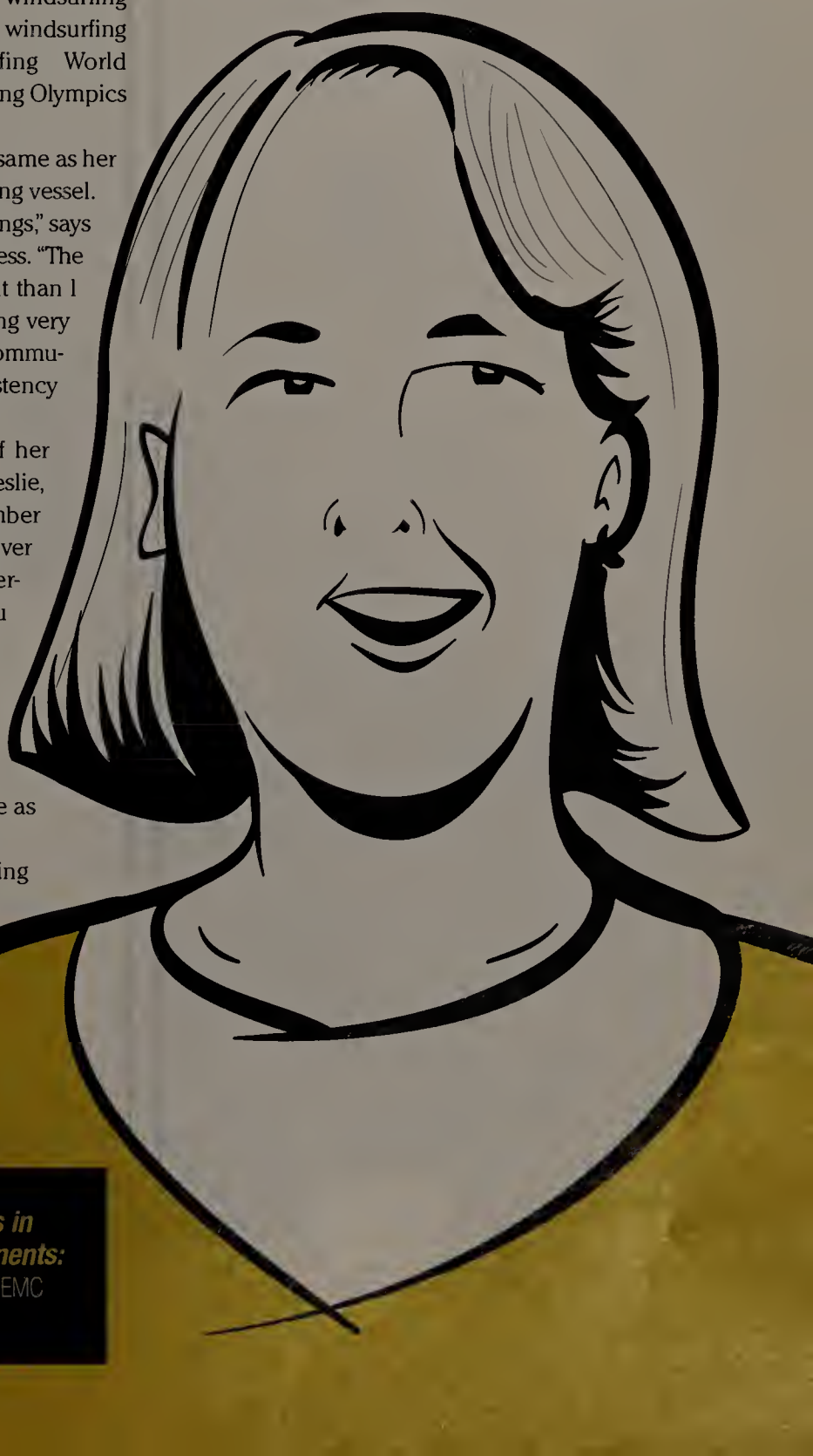
"I'm pretty transparent and clear about things," says Greene, who cites her dislike for deviousness. "The things I do and the way I act are no different than I would expect of others. Mostly it's about being very clear about what we are trying to do and communicating a lot and showing absolute consistency and integrity about what I say and do."

Greene's unassuming leadership is one of her most appealing characteristics, says Mark Leslie, founder of Veritas Software and a former member of VMware's board of directors. "I am a believer that one of the most important traits of leadership is humility and a genuine belief that you aren't better than other folks and do your job to help the business. Leadership [like Greene's] is a quieter, equally thoughtful thing," he says.

"Greene is a very strong believer in sharing information broadly and engaging people as partners in the business," Leslie adds.

If she were not heading up the fast-growing server-virtualization trendsetter, Greene says she would try her hand at moviemaking (this despite not owning a television). The studios will have to wait, as Greene is clearly on track to deliver some of the best virtualization in the industry.

What she cites as her biggest career accomplishment is also a testament to her humble nature: "Working with everyone to build up VMware," Greene says quietly. ■



ANTONY HARE

//VitalStats

Position: President, VMware
Age: 49 **Years at company:** Seven **Years in industry:** 19 **Major career accomplishments:** Founding VMware in 1998 and then selling it to EMC in 2003



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One great

Craig Hinkley, Bank of America's Australian-born network honcho, has architected the country's largest VoIP rollout ever.

BY TIM GREENE

No doubt about it, Bank of America's Craig Hinkley, architect of a 180,000-phone VoIP network, likes to gamble on big projects involving new technologies.

Taking chances for the big payoff is typical of Hinkley, who was born in the southern Australian seaside city of Warrnampool, Victoria. Eight years ago, for example, he moved 7,500 miles to San Francisco, taking a chance on an IT consulting job he had been hired for over the phone. Hinkley's wife, whom he had met in college, dreamed of living closer to her native Vancouver, Canada, and he felt he was well prepared to tackle a U.S. IT job. In Australia, he had worked for a mining company that spun off the IT staff into a network consulting firm; did pre- and post-sales engineering and project management for two years with UB Networks (now part of Alcatel); and earned Cisco Certified Internetwork Expert certification.

"I landed in San Francisco with a wife, a 16-month-old and 10 suitcases. It was one of the most exhilarating times of my life," Hinkley says, recalling the 10 days he had to find an apartment, buy a car and get set up before starting work.

And what a job — Hinkley's first assignment was consulting with Bank of America on its LAN and WAN infrastructures. The IT executives there quickly realized he had more to offer. "I'd sit in meetings, and they'd start talking about different technologies, like DNS and firewalls," Hinkley says. "I'd provide decent input, and they'd look at me and say, 'Aren't you the router/switch guy?'" He was, but not for long.

After consulting full time for the bank for three years, he took on an assignment to build a national IP backbone to support the newly expanded company, which had grown from a merger with Nation's Bank. The backbone was the first generation of what became the bank's optical core network, which now spans 14 cities. Bank of America also offered — and he accepted — a full-time job.

Hinkley followed up the IP backbone project with another doozy — a 2001 multibillion-dollar deal outsourcing network services to Electronic Data Systems. From that project, he says, he learned how to make decisions by breaking the business into functional components. "How do you drive an apples-to-apples comparison that allows you to make strategic decisions about what's best short- and long-term from financial to business practices to technology enablement?" he says.

With the understanding he gained from working on the outsourcing project, he broke the current VoIP initiative into infrastructure and application components, giving datacom and telecom staffs a clear idea of how they would contribute to bringing the plan to fruition. A leader must give his team a clear picture of where they are going and the steps it will take to reach the goal, he says.

"That gets people comfortable and excited so they can become more supportive of it," says Hinkley, who is senior vice president and manager of strategy, architecture and security for enterprise access and desktop services. "If they can see it can actually be achieved, people are more willing to buy into it.... I'm not just someone who paints you a picture of the future and can't tell you how to get there."

Perhaps this has helped with Bank of America's VoIP rollout, which calls for replacing more than 450 PBXs and voice-mail systems with Cisco VoIP gear. The bank started installing the new system this year in banking centers and enterprise locations; the rollout is scheduled to continue in phases through the end of 2007.

Hinkley certainly doesn't just lay down rules, says Nilesh Jadv, the company's senior vice president of network architecture. "He hears everyone's views and everyone feels he has contributed to the end goal," Jadv says.

Plus he makes it fun. "He can joke around and still crisply get his point across. He is very energetic," Jadv adds.

Hinkley has a valuable mix of technical and verbal skills, the origins of which stretch back to his high school days, when he competed on the debating team, acted in school musicals and was captain of the school's Australian-rules football team. He won a prize for top scholastic performance among the boys in his senior class.

His high school activities prepared him well to capture one of 50 slots in the competitive computer science and business program at Melbourne's Swinburne University. The competition included a review of his public school academic record and an interview, and resulted in an $8,000 per year stipend to cover living expenses.

During his college days and early in his career, he earned extra money playing on the Port Melbourne Football Club. "I loved that sport. It's full-body contact, you've got to be fit, you've got to be agile. It was a way to vent frustration and aggression," he says.

Now Hinkley relaxes by hiking, golfing and playing with his two children, for whom he has high hopes. "I want my children to grow up healthy and perhaps attend an Ivy League school or two," he says. And why not? As Hinkley says, "I'm living the American dream." ■

//VitalStats

Position: Senior vice president and manager of strategy, architecture and security for enterprise access and desktop services, Bank of America ***Age:*** 35 ***Years at company:*** Four ***Years in industry:*** 15 ***Major career accomplishment:*** Planning Bank of America's 180,000-phone VoIP network.



ANTONY HARE

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Red Hat CEO Matthew Szulik turned a passion for collaborative software development into leadership of a market-topping Linux distributor — and a profitable one, at that.

Open source's

BY JENNIFER MEARS

Matthew Szulik stills remembers when, fresh out of college in 1978, he attended a meeting of the newly formed Massachusetts High Technology Council and watched Digital Equipment founder Ken Olsen bring out one of the company's PDP minicomputers and put it on a folding table.

"There was so much innovation occurring in the greater Boston area, and I was a 21-year-old kid, wide-eyed and impressionable.... [The experience] continues to have an impression on me," says Szulik, CEO of market-leading Linux distributor Red Hat.

"I got to see men who not only had compelling visions to create great, sustainable companies at young ages, but also who understood the responsibility of doing positive things for the community. It wasn't about exclusively making money and stopping," he says. "It was about innovating and creating technology that would improve the lives of others."

Such missionary zeal for the greater good keeps Szulik motivated personally and professionally. He drives himself hard in the office, but makes it a priority to leave time for family. A husband and father of three, Szulik forgoes the golf course "because I don't want to spend four and a half hours away from my children."

Instead, he spends hours on the road on weekends driving his son to Amateur Athletic Union baseball games. "And then when he goes to sleep at 11 p.m., I try to find a Starbucks that's open to get a wireless connection to check my e-mail," Szulik says.

Szulik's commitment to his family is amazing, says Steve Albrecht, associate dean of the Marriott School of Management and Arthur Andersen professor at Brigham Young University in Provo, Utah, and a Red Hat board member. "For a CEO that is so driven and so passionate, to see how he cares for his family and how important his family is to him, is really inspirational," says Albrecht, who met Szulik in 2001 during one of Szulik's many speaking engagements at colleges and universities worldwide.

Initially, Albrecht was struck by Szulik's professional enthusiasm. When asked to join the Red Hat board, Albrecht had no hesitation despite the company's somewhat tricky business model. "Matthew comes across as extremely knowledgeable and enthused about what he's doing," Albrecht says. "It's very difficult to interact with him and not get excited."

Red Hat employees say Szulik's unabashed energy is one thing that makes the company so strong. A hands-on guy, Szulik makes himself very accessible to employees and spends a lot of time meeting with engineers, help-desk staff and people in sales and marketing, a media relations representative says. He even goes so far as to share his favorite books from his personal library.

Szulik's library includes business-focused nonfiction, sports-related novels and popular fiction. "I tend to like books that move the soul," he says. "I just finished reading a beautiful story about my beloved Boston Red Sox called *The Teammates*. It is written by David Halberstam and it made me cry."

Szulik grew up in New Bedford, Mass., a coastal town just west of Cape Cod. An early interest in science and technology led him to St. Anselm College in Manchester, N.H. He graduated in 1978 and, armed with a bachelor's degree in natural science, returned to Massachusetts, settling in Cambridge.

There Szulik had his first exposure to freeware, or open source software, which was in the process of being created at nearby MIT. He attended several lectures by Richard Stallman, the founder of the free software movement and author of the GNU Public License.

Szulik liked the movement's collaborative approach to software development and the idea of using technology for more than financial gain. This perspective has driven Szulik throughout his career. After spending time at several software start-ups, he accepted an invitation to come to Red Hat in 1998. Szulik became CEO in 1999, shortly after the company went public.

"When I joined Red Hat, most people did not have the awareness of Linux and open source software that they have today. Many thought, 'You're going to try to do what with something that's free!?'" Szulik says. "My father was my most outrageous critic. When I joined Red Hat, he told *The Wall Street Journal* that I should get a good job like my brother and work at IBM."

Szulik faced the challenge with Red Hat head on. He clung tight to his vision of improving the way technology could benefit society by using open source's collaborative approach to create jobs and improve education. He led Red Hat to profitability in 2003 and has managed its rise as the market leader with a more than 90% share of Linux software sales, according to IDC. Today, Red Hat has a workforce nearly 1,000 strong, up considerably from the 30 employees at the company when Szulik took the reins.

"My biggest professional accomplishment is that we have been able to create employment opportunities and validate an economic model around open source software that has allowed other entrepreneurs to create new businesses and exciting projects and new jobs," he says. "Without [Red Hat's] validation of the economic model of open source, that would not have happened." ■



//VitalStats

Position: Chairman, CEO and president, Red Hat ***Age:*** 49 ***Years at company:*** Seven ***Years in industry:*** 27 ***Biggest career accomplishment:*** Built Red Hat into a profitable open source company and the leading Linux distributor.

ANTONY HARE

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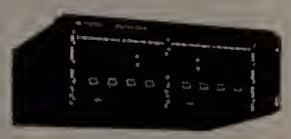
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Ever the entrepreneur

Ten years since coming to Cisco through acquisition, Jayshree Ullal thrives as a top exec thanks to her persistent start-up mentality.

BY PHIL HOCHMUTH

Holding five vice president titles in 10 years at Cisco, Jayshree Ullal is no stranger to change; she thrives on making switches.

Born and raised in Bangalore, India, Ullal had a change in scenery, for example, when she came to the United States to study engineering. She earned a bachelor's degree in engineering from San Francisco State University and a master's degree in engineering from Santa Clara University. She then worked as a chip designer in the semiconductor industry for 11 years. Next a switch in jobs and roles led her to the top marketing position at Gigabit Ethernet start-up Crescendo Networks, which Cisco bought in 1996 as the foundation on which it built its now-dominant Ethernet switch business.

In her decade as a Cisco executive, Ullal has led the vendor's entry into optical, storage and security — all considered among Cisco's seven Advanced Technologies, or $1 billion revenue opportunities. In her current role as senior vice president of data center, switching and security, Ullal heads a combined business unit whose products represent on average almost half of Cisco's quarterly revenue.

Ullal's many job swaps at Cisco involved overseeing and assimilating dozens of acquisitions. A skill that has served her well, Ullal says, is the ability to relate to executives and engineering talent that comes with these buyouts.

"I have great empathy with the companies we acquire because I know how difficult the transition can be," she says. "These are people on a mission and proud of their company, teams and products. I always tell people, 'Don't give up. Hang in there; the first year is toughest. I myself shed many tears in that first year.'"

The key is keeping top talent from acquired companies focused on the technology goals from prior to the buyout. In other words, get them to think as a business unit of Cisco, but to handle tasks and problems with a start-up approach, she says, adding that she still tries to operate with a free-flowing start-up mentality.

"I'm not the world's greatest follower of processes and procedures," she says. "I love technology and I love to learn. I'm amazed at how little I know, and how much more there is to know.... I think of myself as having more entrepreneurial traits" than the habits of a typical corporate executive.

Although she holds two engineering degrees, Ullal never saw herself as the prototypical product designer. As an engineer, first designing chips and later switch architectures, Ullal describes herself as "good, but not great." But a friendly disposition helped her communicate with customers.

"If one of my chips had a problem, I would have to talk with the customers to fix it," she says. "It was hugely fulfilling and satisfying. So in that sense, I probably was not the stereotypical engineer."

Ullal attributes her upbringing in India for her background in the sciences and her competitive attitude. Her physics professor father and her own mathematical talents steered her toward the sciences early, she says. (Physics and thermodynamics were part of her sixth-grade homework.)

"That, coupled by the fact that there are certain things I was not good at — such as the humanities and arts; not being able to do needlework greatly disappointed my mom," she quips.

The academic environment was very competitive growing up, she says. "If you got a 98 on a math test, Dad would say, where's the other 2%?" This competitive culture was necessary, however, as hundreds of thousands of students apply annually for a few thousand slots at India's most prestigious technical universities. (Statistically, getting into Harvard or Yale is almost twice as likely).

As Cisco expands into more product lines and technologies, it is becoming more global. Ullal says she particularly enjoys the expansion in India, where she has family and friends, although her husband and daughter live in the United States.

While Cisco has had a presence in Asia and India for almost a decade, more recently the company has shifted its operations there to strategic R&D. In October, it earmarked $1 billion in investments in India. Cisco will further look abroad to strengthen its engineering talent pool, instead of as a cost-cutting measure. "By having a presence in [India and China], you can expand your development pool," she says.

However, Ullal does not believe that this trend will lead to a complete off-shoring of talent for any high-tech company.

"I really believe some key innovations and creativity come from the talent cultivated in the United States," she says. "I've had education in India and here. I learned a lot of mathematics, chemistry and fundamentals in India, but I did not learn the creative side [of engineering] until I came here. The two education systems could learn a lot from each other." ■



ANTONY HARE

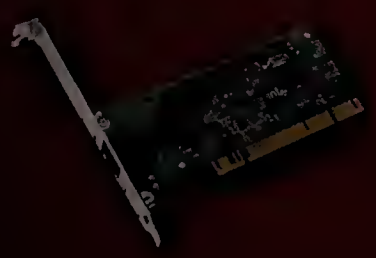
//VitalStats

Position: Senior vice president of data center, switching and security ***Age:*** 43
Years at company: 10 ***Years in industry:*** 25
Major career accomplishment: Taking over Cisco's combined data center, switching and security product lines, which account for almost half of the company's revenue.



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//Carriers on the IP front
Newly merged behemoths will wage war over the enterprise, but advanced IP won't be a weapon early on. SEE STORY AT RIGHT.

//Chasing the big one
Application-aware networking is a whale of an opportunity neither Cisco nor Juniper can let slip by. PAGE 58

//Is Cisco finessing a management coup?
As Cisco orchestrates its intelligent management strategy, industry watchers wonder how the vendor's efforts will affect legacy platforms. PAGE 60

//Tempers cooling city by city
With managed services in play, carriers are turning down the heat on municipalities looking to provide broadband access networks. PAGE 62



RICHARD DOWNS

Carriers struggling over IP

Newly merged telco giants must face down integration and financial issues before they can tackle enterprise IP.

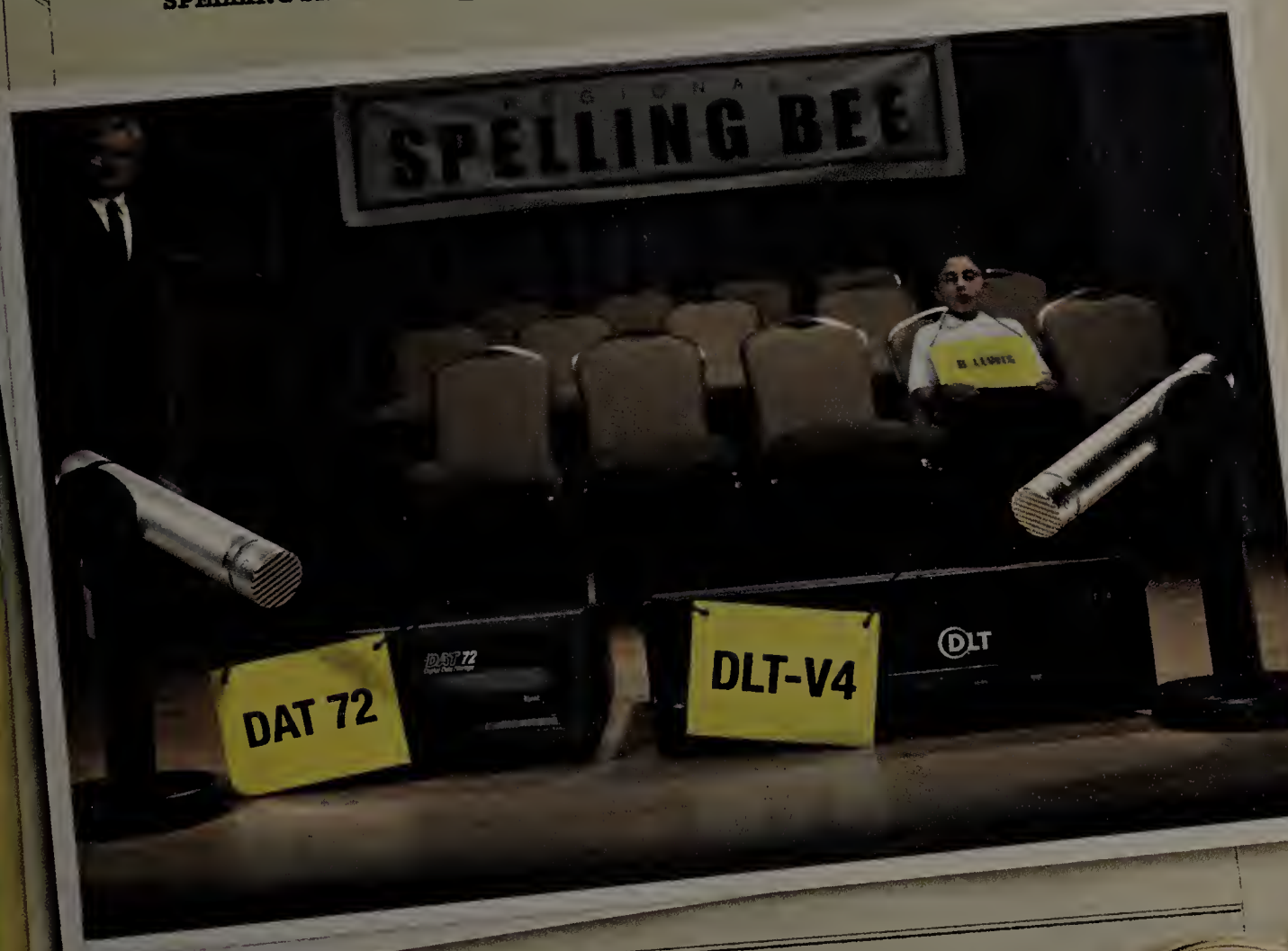
BY JENNIFER JONES

Like Godzilla preparing to storm Tokyo, the new AT&T (formed from SBC/AT&T merger), Sprint Nextel and Verizon (with MCI) will soon pursue corporate customers with a monster-sized vengeance. But from all appearances, advanced IP services, as critical as they ultimately will be, won't be part of their early attack plans.

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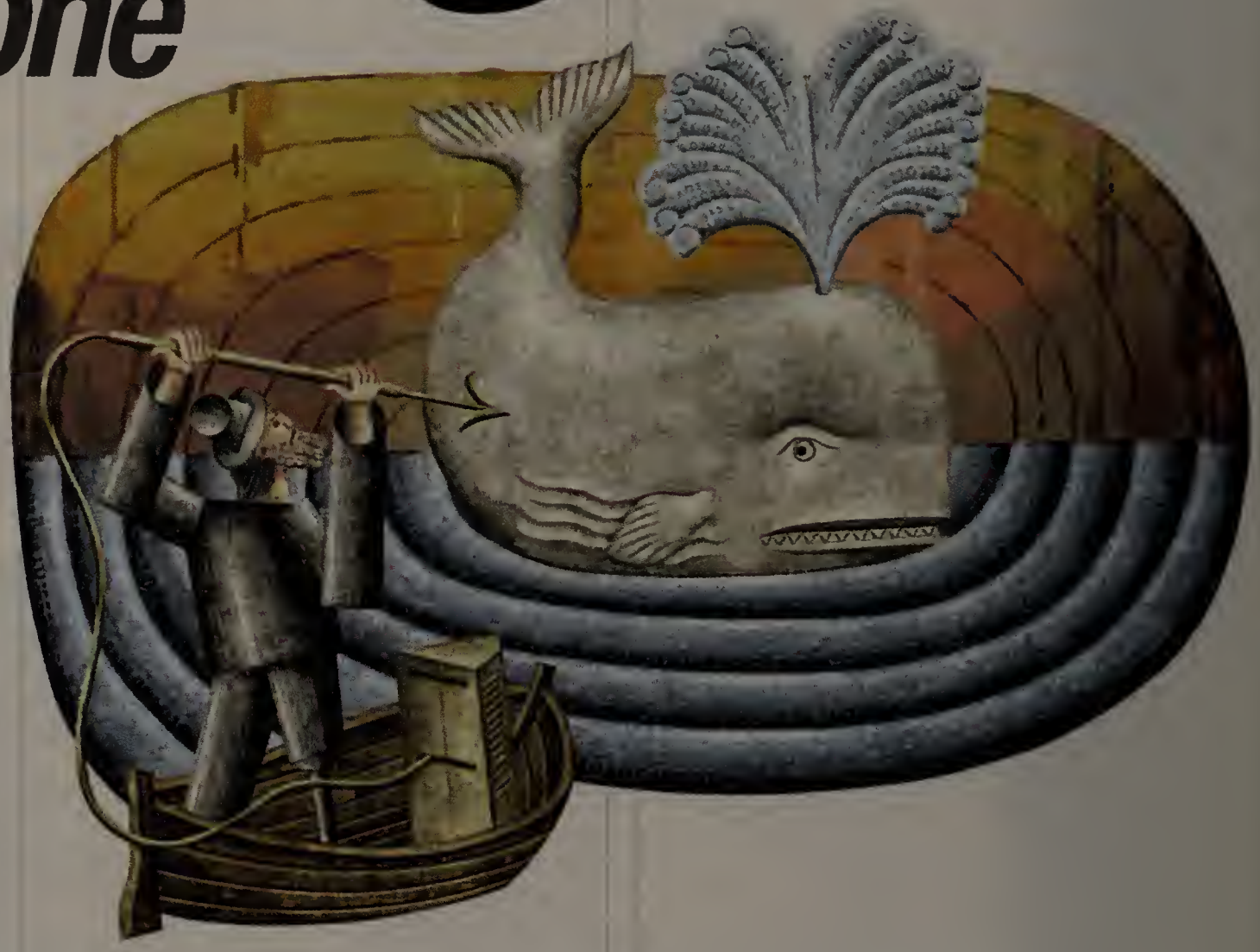
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Chasing the big one

Application-aware networking is a whale of an opportunity neither Cisco nor Juniper can let slip by.



JOANNE CUMMINGS

Gregg Chottiner is truly in the trenches of the application-aware networking fight. As CIO of the University of Maryland University College (UMUC) he must ensure that students and professors accessing the largest public distance-learning university in the world can do their coursework 24/7, from anywhere.

The Adelphi, Md., university runs two critical Web-enabled applications: PeopleSoft, for human resources and finance administration, and WebTycho, a proprietary learning-management system. As the university grew, controlling performance of these applications became difficult, he recalls.

"We were continually having to buy new networking hardware just to keep things static," Chottiner says, noting that his core network is composed of Cisco gear. "And we kept buying more network bandwidth, but we realized we weren't solving the problem that way — we were just spending more money."

The answer came in a pair of Juniper Networks' DX3250 application-acceleration appliances. Based on technology Juniper acquired in April from Redline Networks, the gear not only improves performance of critical Web applications, but also handles security via an integrated intrusion-prevention system.

"Anybody who has a Web app [for] customers or clients needs to look at [application-aware networking], because people don't have much patience anymore," Chottiner says. "If it's an underperforming Web site, or it's difficult to navigate, they don't come back."

UMUC's case is becoming the norm, especially as more organizations consolidate and centralize their servers and applications for better security and accountability, analysts say. The bulk of these newly centralized applications weren't designed to run across the wide area. They use protocols, such as MAPI, designed for an environment in which the client is no more than 100 meters from the server. "The protocols are very chatty, and with applications being hosted in Chicago and serving people in Bangalore and China, performance gets bad fast," says Joe Skorupa, a research director at Gartner.

Application performance will get worse as organizations begin moving to Web services and service-oriented architectures (SOA), he says, adding that with the expected upturn in SOA applications, the market for application acceleration and application-aware networking is poised to reach $1.5 billion this year.

Enter Cisco and Juniper and their push to make the network more application-aware. The idea, they say, is to offload low-level communications and protocol-manipulation tasks from overtasked servers to high-performance network gear. In many cases, removing those tasks can free up as much as 80% server utilization, while resulting in more efficient applications with faster response times and lower bandwidth needs — all without having to invest in a lengthy, complex and expensive application rewrite. The sweet spot, they say, occurs when application-aware networks do all that, plus security functions such as SSL VPN and intrusion prevention and detection and key tasks such as load balancing.

To that end, Cisco recently launched its Application-Oriented Network (AON) initiative, and Juniper announced its intention to deploy enterprise infranets — both of which are code words for this multifaceted, application-aware networking gear. Although Cisco AON gear will be fully integrated with its signature routers and switches, Juniper's offerings are designed to coexist with the underlying network, because in many cases, Juniper doesn't own the infrastructure — Cisco does.

The prospects look good for Cisco, with its large installed base, and for Juniper, with its feature-rich offerings, analysts say. Still, they're late on the scene — which has forced each into acquisition mode. Cisco acquired FineGround Networks, and Juniper grabbed Redline and Perabit Networks. Others that have staked out territory are F5 Networks, Citrix Systems (which recently acquired NetScaler) and Radware, on the front-end application-processor side, and Riverbed (recently bought by HP), Expand Networks and others, on the WAN-optimization side.

Cisco and Juniper have additional competition from IBM, Microsoft, SAP and Oracle on the applications side, especially when it comes to building efficient SOA-based applications. "The application vendors all have proactive strategies for SOA ... that CIOs are just now beginning to adopt.

Applications continued on page 64

RICHARD DOWN

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Cisco vs. OpenView and Tivoli?

Cisco is diving into network management but swimming among skeptics.



RICHARD DOWNS

BY LYNN HABER

Cisco one day would like to be known as much for IT infrastructure management as it is for routers and switches — at least that's the general industry belief, even if the company hasn't said so outright.

What Cisco has said is that it plans to develop management applications that leverage advanced instrumentation as well as connect to systems-management software for optimizing performance and troubleshooting. The goal, through intelligent hardware and virtualization, is "to reduce complexity and enable greater synergy with system-management vendors, rather than less, by allowing users to see what's happening in the network," says Cliff Meltzer, senior vice president of Cisco's network management technology group.

Cisco's recent acquisition of Sheer Networks' abstraction software, which was used in part for the Network Application Performance Analysis (NAPA) product suite Cisco announced in December, is one manifestation of the company's management goals. Another is its Application-Oriented Network strategy. With initiatives such as these underway, Cisco will be able to manage diverse networks more easily, Meltzer contends.

But that's just the beginning of Cisco's management ambitions, industry watchers say. Many speculate that the vendor's long-term goals include providing a broad IT infrastructure-management platform for networks, storage and servers. With this platform, Cisco ultimately will go up against system-management stalwarts Computer Associates, HP and IBM, as well as today's rising stars in network management.

Interest in Cisco's management story is great, but skepticism is greater. Many industry watchers aren't so sure the powerhouse can translate its network hardware success to the management software market.

"From the Sheer acquisition, Cisco gets proven management software and technology that improves the interoperability between Cisco gear and systems-management vendors," says Robert Whiteley, analyst at The Yankee Group. However, to lay the groundwork for its vision of holistic IT management, "Cisco must ensure that the interfaces for Sheer's technology evolve into true industry standards," he adds.

If Cisco does focus its strategy on open standards that will let users pick the best management tools, it will have huge market push, says Jim Hull, vice president of engineering services at MasterCard International in Purchase, N.Y. "People like me will say, 'Let me have three,'" he says.

But Cisco doesn't have the necessary influence in storage, servers or platforms, Hull says. "I don't see Cisco coming in and forcing others to comply when other industry giants, like IBM, EMC, Hitachi and Sun, for example, haven't been able to come together," he says, noting that MasterCard uses a blend of management tools and integrates where it can using Tivoli.

Today, many companies use a variety of management tools, but Hull says, "It's difficult to figure out where one starts and stops, and which ones have good APIs to feed into other tools." Better integration can save organizations much time, money and effort. More important, the bottom line for IT executives in managing technology is improving agility, which in turn enables IT organizations to adopt faster new technologies and services for enabling better business decisions.

Moving forward

As Cisco refashions its image as a software company, it faces several primary challenges. It must introduce innovative products, create the infrastructure to support a software-sales organization and get corporate IT decision makers on board.

From the standpoint of credibility, Cisco has earned the ear of many of its customers. But that doesn't make the company's future in software a slam-dunk, says Michael Hunstein, manager of network services at Konica Minolta Business Solutions in Ramsey, N.J. "It can't come in at premium cost, which is often the case. It needs to provide a true value-add if users must displace existing solutions, and it must provide a more open solution," he says.

As Hull says, giving up the current capabilities of Tivoli for a Cisco- or network-centric approach is out of the question.

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Cities battle carriers struggles



RICHARD DOWNS

Municipalities, fed up with waiting on carriers for broadband coverage, are outfitting their skies with Wi-Fi.

BY PAUL KORZENIOWSKI

Has broadband Internet access become as necessary to individuals as water and electricity? The answer to that question has been at the heart of a long and often-rancorous dispute between municipal governments and telecom service providers. Tempers are now cooling, as the two sides recently coalesced around a common municipal broadband service model.

The firestorm began in the summer of 2004, when some cities made moves to deploy municipal Wi-Fi networks to compensate for the carriers' failure to roll out broadband Internet access — cable modem and DSL services — on a full scale. As carriers concentrated their broadband initiatives on markets in which they would likely see a quick ROI, they left many pockets in inner cities and rural areas with only dial-up Internet access. Many cities felt obliged to close the digital divide between the rich and the poor.

"One-third of our city was without broadband Internet access, and our service providers told us years would pass before they would serve those areas," says Dianah Neff, CIO for the city of Philadelphia, where the battle became especially heated.

But as the cities launched their Wi-Fi programs, service providers howled about government getting into the telecom business. David McClure, president of the U.S. Internet Industry Association (USIIA), summarizes the carrier position: "Cities should not finance with taxpayer money network monopolies designed to put viable service providers out of business." The USIIA, a trade association in Washington, D.C., has been a vocal advocate of service providers' position.

Legal action

In Pennsylvania and elsewhere, carriers turned to the courts to try stopping governments from rolling out such networks. In more than a dozen cases, state legislators passed laws putting stipulations on cities that wanted to enter the broadband access market. Legislators passed such a law in Pennsylvania, though they granted Philadelphia a special exemption.

The decision was not without controversy. While McClure says the Pennsylvania law passed in an open process during which all of the affected parties were notified, Neff recollects differently. "The only reason we found out about the proposed law in Pennsylvania was one of our lawyers was watching cable television late one Friday night and he saw the bill being introduced near midnight," she says. "If the process was truly open, then we would have been informed about it, and the hearings would have been held at a more reasonable hour."

As the cities persevered and shaped their municipal networks, a common ground emerged. In Philadelphia, for example, Neff issued an RFP in the fall of 2004. As a result of the RFP, the city selected EarthLink to install and manage the municipal Wi-Fi network. The city has some test sites operating now with plans to begin rolling out services in 2006.

The USIIA has no objection to this arrangement, McClure says, while noting that such a partnership came about only after Philadelphia determined it would not be able to run the network by itself. Neff counters, "From the start, our plan was to work with a network provider to build out the network and to open it up so multiple ISPs can offer services over it. It was never designed to be run solely by us."

Muni models

As time heals residual ill feelings, the involved parties need to focus on making the municipal networks a success. The cities have strengths as well as weaknesses.

"Many cities already rely on wireless networks to support a variety of services, such as [those provided by] police, fire and emergency medical technicians," says Berge Ayvazian, executive vice president at The Yankee Group. "Theoretically, they can lower the cost of these services by building a common WAN and then defray the cost of that investment by offering broadband services to residents." Also, cities have experience in

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Cisco has tremendous network knowledge. But a move to encroach on the turf of the established systems-management vendors would be gutsy even for Cisco, many industry watchers say. "IBM, HP and CA already have management dashboards for systems, applications, business processes and policies that users can plug into and out of in an open manner," says Frank Dzubeck, president of Communication Network Architects.

Furthermore, the systems vendors are focusing on intelligent tools, software and systems to provide sophisticated management, Dzubeck says. "These vendors are saying you don't need an army to manage IT facilities," he adds, noting that Cisco hasn't articulated a strategy for self-management capabilities.

At a minimum, says Paul Scheib, director of IS operations at Children's Hospital Boston, he expects any Cisco management tool to provide real-time monitoring so he knows about problems before users come calling. "Ultimately, I want fast troubleshooting or a correlation of events on the network, applications and hardware," he says.

Midtier IT shops, such as Children's Hospital, want basic functionality in a tool set that's easy to support and not resource-intensive, Scheib says. That thinking is what led Scheib to EMC's Smarts for network monitoring and event-correlation notification. "We bought Smarts for its auto-discovery feature that enables the software to learn about the network as it changes," he says.

A better way

Intelligent software brings multiple benefits to the management mix. It provides automation, provisioning and standardization across all vendor systems. Combined with best practices (ITIL processes, for example), it can address the business-driven part of IT management, and it enables the management of end-to-end services across diverse hardware and software components.

But intelligent hardware also is critical.

The network, considered by some industry watchers as the last bastion of complexity, is again in the management spotlight. The rise in real-time, network-centric applications — such as voice, video streaming and messaging — and storage and services for distributed applications is putting increased pressure on the WAN and therefore demands new management solutions.

"We're seeing hardware becoming commoditized and network complexity requiring better management tools," Yankee's Whiteley says.

With network management no longer a silo activity, and network metrics key to achieving a services-driven IT architecture, industry participants agree that intelligent hardware is key to the future of network management. Benefits of intelligent devices include faster reaction and resilience to hardware-related issues through self-management, savings on network resources, and optimization of hardware capability and performance.

Some users are surprised Cisco didn't take the initiative earlier to make its management structures more robust. Using as an example Cisco IP phones, which Children's Hospital uses, Scheib points out that the vendor is lagging. Its point products aren't mature, he says. "When it comes to wireless and IP voice, vendor support and management is still a wild card," he says.

Yankee's Hamilton adds, "Who wants to spend millions on Cisco IP phones and turn over management to a 10- or 20-million-dollar start-up?"

Cisco is taking a logical step by increasing element-management capability around its devices, says Bill Emmett, chief solutions manager at HP. Although he acknowledges that some competitive situations may arise as Cisco broadens its network-management capabilities, he says the vendor's efforts mostly complement what HP does with systems management. HP OpenView is about managing heterogeneous networks, he says, and HP's position is that intelligent hardware and software are needed in today's complex infrastructures.

In addition, corporate IT executives look at the bigger picture. "Customers want integration, a stable vendor and maturity in the IT-management industry," Emmett says.

As the battle for network management plays out, everyone agrees that competition can be a good thing (though neither CA or IBM would comment for this story). As Dzubeck says, "The lines are blurred, and one thing we can expect in the management area is that competition will be rampant."

Haber is a freelance technology writer in Norwell, Mass. She can be reached at lthaber@comcast.net.

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Cisco and Juniper ... have to be able to introduce their concepts to that same CIO," says Tom Nolle, principal of CIMI. "The challenge is that the CIO isn't going to think he has a network problem but an application problem. And IBM and Microsoft are not going to tell him otherwise. So if Cisco and Juniper don't tell him otherwise, they become marginalized."

IBM in particular is formidable, especially with its recent acquisition of SOA appliance maker DataPower, Nolle says. "The giant killer in this space is a giant — IBM. Its acquisition of DataPower raises the risk level for all of the network vendors, because IBM could begin to sell the DataPower appliances with its own SOA applications and have those appliances just gradually draw away all of the feature value out of the lower-level networks. If IBM does that and is successful, it would make it extremely difficult for the network vendors to respond," he adds.

In addition, Cisco and Juniper are battling their own reputations as strict bits-and-bytes vendors. At Thomson Financial, for example, Cisco gear powers the network, but F5's BigIP application-acceleration appliances ensure optimal performance of Web applications to financial clients worldwide, says Mark Maroclo, manager for system support and engineering at the Rockville, Md., company. Thomson Financial selected F5 because of the vendor's sole focus on application-level performance, he says.

"It's the degree they understand my problem," he says. "Cisco understands my problem as far as switching and routing and those real low-level aspects of the network that need to be stable. But F5 lets me capture, manipulate, track and inject things in the application stream. You have no idea how powerful that is."

BigIP has saved his company extensive time. "To make this application understand HTTPS would have taken a month's worth of development time," he says. "With BigIP, when you call that piece of data from a server, we can add a rule that says I'm going to exclude that from the URL direction rule and then anything else is going to get processed in sequence and secure. It's a huge savings."

Cummings is a freelance writer in North Andover, Mass. She can be reached at jocummings@comcast.net.

//Cisco vs. Juniper in application-aware networking

	CISCO	JUNIPER
Strategy name	AON	Enterprise infranets
Key acquisitions	FineGround, for front-end application processing and Web acceleration.	Redline, for front-end application processing and Web acceleration.
	Actona, for WAN optimization.	Perabit, for WAN optimization.
Implementation	Fully integrated with Cisco routers and switches.	Layered on top of underlying switches and routers.
Functions	Application acceleration, load balancing, QoS, security, application integration.	Application acceleration, load balancing, QoS, security, application integration.
Current products	Application Velocity Engine, for WAN acceleration; Wide Area Application Engine, for WAN optimization.	DX series, for Web acceleration; WX series, for WAN optimization.
Outlook	Late to market, but has extensive installed base and untapped market ($3.1 billion this year). Technology so far is not as robust and feature-rich as competitive offerings, but it comes from the market leader.	Late to market, but reputed to have high-level, feature-rich technology — at both the data center and the WAN. Major hurdle is that Cisco owns the enterprise, but will get a foot in the door because of its strong security wares.
	Needs to watch IBM, other SOA and application vendors.	Needs to watch IBM, other SOA and application vendors.

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Carriers continued from page 56

Instead, the behemoths will first promise corporate users more integration packages, consulting options and managed services. They'll battle furiously on these fronts, intending to turn decent profits that will see them through the longer-term fight for IP dominance.

Experts don't expect carriers to make major corporate IP inroads until 2009. Many corporate IT executives are concerned with more practical matters. For instance, some say they just want to see familiar faces once the merger dust settles. Others say they hope customer service doesn't tank as the carriers become internally focused on merging assets.

"We are not worried about infrastructure support, just the continuity of people in various organizations. The backbone of each of the major carriers and their partners are more than sufficient to handle our requirements. We also believe that our choices for equipment and network services will not be impacted by the vendors' consolidation," says Tony Pizzelanti, vice president of IT at Anthony Sylvan Pools, a pool and spa company in Mayfield Village, Ohio.

Though not overly worried, IT officials stress that they don't want to be ignored. "I have not been approached by any of the major carriers in quite a while," says Anthony Maceroli, managing director of IT at Fitch Ratings, a New York issuer of ratings and opinions on major credit markets that uses Verizon services. "It seems Verizon is preoccupied with the integration of MCI. It hasn't been in marketing mode as far as I can tell," he says.

Ignoring existing customers and missing the chance to grab additional corporate accounts would be a mistake for any of the carriers, especially given their need to address "three main pain-points," says Gary Rubinoff, managing partner at BCE Capital, a venture capital firm in Toronto. "As the [incumbent local exchange carriers] face increasing competition and erosion of their legacy voice-revenue streams, they must focus on increasing cash flow, reducing capital expenditure and improving competitiveness. Service platforms generally address all three of the pain-points," he says.

//The battle for enterprise accounts

Here's what to expect of the carrier conglomerates when it comes to your business:

- The new AT&T will play up MPLS and network management.
- Sprint/Nextel will tout wireless and wireline convergence.
- Verizon first will focus on MPLS and move into convergence.

Each carrier's platform will bear its own stamp, says Lisa Pierce, a vice president of Forrester Research. Sprint Nextel will try to exploit its wireless and wireline convergence, while the new AT&T will make the most of its expertise with MPLS and in network management, she says.

Reading Verizon's future direction is tougher, Pierce adds. "There will be a lot of picking and choosing in terms of the best services MCI has to offer," she says, noting that Verizon is unlikely to abandon its new iobi Enterprise voice and messaging services platform.

Bob Rosenberg, president of Insight Research, explains the carriers' reluctance to move to IP: "In the near term, no one is going to benefit from IP. What you will see is essentially a diminution of revenues as carriers move customers from TDM to IP." But that reluctance can only last so long, he adds. "The problem with IP for the carriers is that they lose control of the end account. Over the longer term, there may be newer opportunities for the providers. But this will only happen when they are no longer phone providers but providers of digital business services," he says.

This fundamental identity shift will be difficult but imperative, Rubinoff agrees. "The growth of IP technology in the network has proven to be a double-edged sword for the ILECs. Specifically, it forces the carriers to be providers of low-value packet pipes," he says.

While carriers have their fair share of IP problems, the shift has been slowed further by lethargy on the part of corporate buyers, Pierce says. "Close to half of the business customers we talked to in a recent study said they didn't see any reason to move" to IP voice, she says. "Generally, there will develop a greater acceptance of IP and movement in that direction. But what customers say vs. what they do in terms of IP adoption can be very different. It will be incremental and involve no hockey stick."

Steadfast interest, but no big moves

Incremental or otherwise, many corporate customers say their interest in IP is steadfast. "Although our underlying network architecture has changed several times over the past 10 years — going from frame relay to ATM to MPLS VPN — IP is still our major need and seems to me to be as future-proof as any technology," Fitch Ratings' Maceroli says.

At Fitch Ratings, all internal applications are browser-based, so the company mostly runs HTTP and Web services from remote offices to the data centers, he says. In addition, the company provides data feeds to outside customers via IP and allows travelers and telecommuters remote access to internal applications via IPSec.

Sylvan Pools' Pizzelanti also characterizes his company as ready for the IP plunge. "We started early enough in our planning to be ahead of any thrust by vendors toward VoIP. We went to them at least one and a half years ago," he says.

Major moves aren't likely, however, Rosenberg says. "No one believes that most enterprises are going to forklift TDM and replace those infrastructures with IP gear. We are predicting that 2009 will be the first year that you'll see more IP sets on desktops," he explains.

This steady evolution to IP hinges on carriers' embracing IP, he says. "There are some innovative ideas out there. But there isn't any marketplace traction until the carriers back them," especially because only the largest companies can justify building their own advanced IP networks, he adds.

For now, start-ups and smaller companies have been the ones dashing out in front with IP-based solutions, observes Rubinoff, whose firm has backed IP players such as Sylantro and NexTone. "We will see ILECs offering their own versions of VoIP," he says — just not right away.

Jones is a freelance writer in Vienna, Va. She can be reached at Jjwriterva@aol.com.

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offering other universal services, such as trash removal and water.

Yet the local governments face potential hurdles. "Telecommunications is an extremely competitive business, and cities may struggle to match commercial offerings," says Neil Strother, an industry analyst with The NPD Group. Municipalities have to invest in network infrastructure, including control centers to monitor connections and new billing systems. How they will pay for those investments is uncertain.

Besides Philadelphia, The Yankee Group identified 200 cities planning municipal Wi-Fi networks, including Anaheim, Calif.; Cleveland; Grand Rapids, Mich.; Minneapolis; Seattle and Portland Ore.

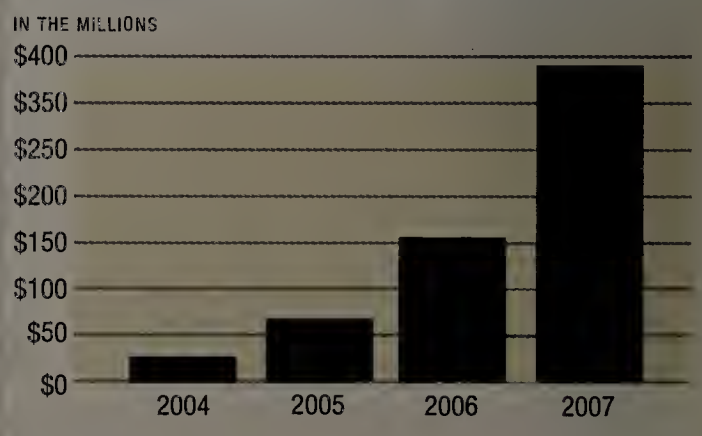
A wide variety of business models have emerged. In response to an RFP issued by San Francisco, for example, Google recently proposed an advertising-based model, and free wireless ISP SFLan suggested building a network with solar-powered access points. Other cities have expressed interest in using location-based services to allow advertisers to target users near certain locations. Such services could help defray the upfront costs and generate revenue.

Not every plan is viable. For example, Orlando provided free Wi-Fi access, but has gone back to the drawing board to figure out its next step. The model that seems to be gaining the most attention is a hybrid service with cities offering low-speed (300-kbps) access for free to select residents and marketing 1-mbps broadband services for $10 to $20 per month to consumers and businesses.

The ultimate success or failure of municipal broadband networks will become clear as cities roll out their services in the next 12 to18 months. In the meantime, the rancor seems to be subsiding. "Lately, there has been a growing sense of empathy and cooperation," Ayvazian says. "This should help to spur adoption."

//Wi-Fi city spending

The Yankee Group charts the capital investment in municipal wireless broadband networks worldwide, from 2004 to 2007.



Korzienowski is a freelance writer in Sudbury, Mass. He can be reached at paulkorzen@aol.com.

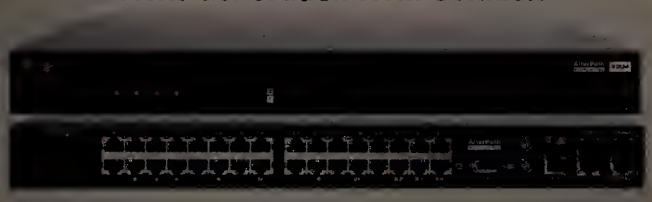
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Four of the network industry's most powerful individuals tell us about the people who have inspired them.

Powerful influences

BY JULIE BORT

John Chambers, *president and CEO, Cisco* My mom and dad have had the greatest impact on me professionally. They were both doctors, and they taught me how to be calm under pressure. In terms of business leaders, Jack Welch has been inspirational, primarily in terms of his philosophies — such as being No. 1 or No. 2 in your industry as well as learning how to deal with the world the way it is.

In addition, his Majesty King Abdullah II of Jordan has had a major influence on me. He is in a very challenging spot in the world where his only natural resources are his people, and he is currently focusing half of his budget on education. So his ability to balance the short-term and long-term objectives for his country, even under the utmost of pressure, is something I truly admire and am learning a great deal from.



INFLUENCE { Majesty King Abdullah II of Jordan }

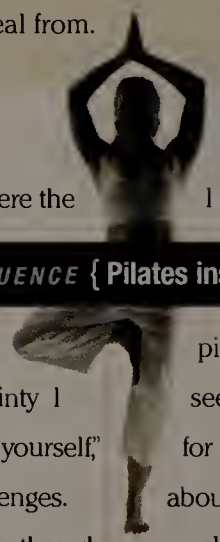
Eva Chen, *CEO, Trend Micro* Steve Chang, my brother-in-law and now chairman/founder of Trend Micro, has been my direct mentor in business. Steve, my sister Jenny and I basically worked together from the beginning of the company in the 1980s. Steve always said, "Be the best part of yourself." This means know yourself, focus more on your strengths rather than your weaknesses, and apply those strengths against any position you hold. Actually, the word "trend" in Chinese ideogram is complex — it means "go where the energy goes." Steve calls it using free energy as a business practice.



INFLUENCE { Steve Jobs }

In the early days Steve and I knew I had to go where the gaps in the business were. I rotated through various jobs over time — manufacturing and global logistics, regional office start-ups, marketing, CTO and now CEO. At times of uncertainty I always recall the sentence "be the best part of yourself," and I overcome the hesitation to take on new challenges.

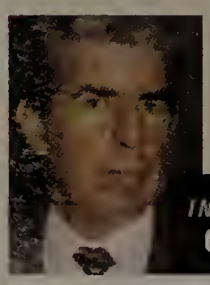
Another Steve — Steve Jobs — well, he is my hero, though I have never met him. I admire his persistence and ability to come back. He has a passion for innovation and perfectionism for the customer. He was away from the company and came back even stronger and more focused. I did the same by choice.



INFLUENCE { Pilates instructor }

My art teachers also have influenced me — they helped me look at the big picture, zoom in on the details and zoom back out to see how all the pieces fit together. That is very important for a CEO. Even my Pilates instructor makes me think about the business differently. If I have terrible pain in my neck, I may have to exercise my back or my stomach to make the pain go away. If there is an issue that seems to be in one part of our business, sometimes we have to look at an entirely different part of the business to fix the issue.

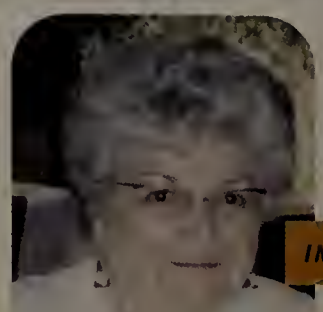
John Partridge, *president and CEO of Inovant, the global IT operation for Visa International* Throughout my career, I have been surrounded by many colleagues who influenced me, but the two people who stand out the most are Hans Tjian, [a long-time, well-known banking executive who passed away earlier this year], and Raimundo Morales, [currently general manager of Banco de Credito, Peru]. I had the honor of working with both earlier in my career when I participated in the bank officer training program at Wells Fargo. Hans and Raimundo brought the business focus to operations and technology, and I admired how they strategically implemented information systems to deliver real business value. Like many young executives, I was too eager and wanted to rush through the problem-solving process, but they taught me that the best way to achieve results was to take a more controlled approach. That slice of knowledge has served me well to this day — especially in an industry like payments, where we're processing thousands of transactions per second with virtually no downtime. Taking the time to step back from everything that's going on has proven successful for building solutions to the technology challenges we face everyday.



INFLUENCE { Raimundo Morales, GM of Banco de Credito, Peru }

Dianah Neff, *CIO for the city of Philadelphia* The first person who most influenced me was my mom. She was a working mom in the days when that was not the norm. Still, she always found time to make each of us kids (and there were eight of us) feel special. She demanded we work hard and follow through when we made a commitment, and she was the first to show me how reaching out and helping others (no matter what our situation was) could enrich a person. She is one great woman, who even at 80 works to help "older" seniors have productive lives.

The second person who most influenced me was my senior high school English teacher, who helped me understand the wonders of expanding my world through reading. A third person was a business mentor early in my professional career who helped me move from technical staff to management. And the final key person in my professional life was the city manager in Palo Alto, Calif. Palo Alto was my first government job back in 1986. Under his guidance, I learned how to effectively use technology to improve people's lives.



INFLUENCE { Mom }

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AAA East Central Advances Troubleshooting with Observer

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> **"Observer is like having an employee on site at all hours to manage the network, we've been very satisfied with its capabilities."**
>
> Portia Ulinski, CIO, AAA

Observer's Top Talkers feature shows the current activity for every device on the network in real time.

"We consistently use Top Talkers to track the total amount of stats for each office to see if there is any unusual activity," said Coleman Jennings, senior network engineer. "It's a big problem when a device other than servers, routers or anyone in the IT department ranks high on Top Talkers."

There could be a number of reasons someone tops the list. In one case, Jennings identified an end user transferring a large number of files to a server. He investigated further and discovered that an employee was backing an entire hard drive to that server.

"Through Top Talkers I was able to track down the person who was transferring all that data" Jennings said. "Had I not stopped that person, all the activity would have overloaded the system."

On another day, an application responsible for providing Emergency Road Service stalled. Without that application, services get delayed, which can leave customers stranded at the roadside for an extended period waiting for help. Jennings drilled down with Observer's Connection Dynamics for a packet-by-packet display of the application's communication with each client.

"The time analysis clearly showed there was a problem with the application, which I was able to immediately address–restoring full service to our customers," Jennings said.

Observer monitors network communication around the clock to ensure that AAA East Central constantly receives the information resources needed.

"Observer is like having an employee on site at all hours to manage the network," Ulinski said. "We've been very satisfied with its capabilities. So far Observer has prevented us from experiencing any downtime."

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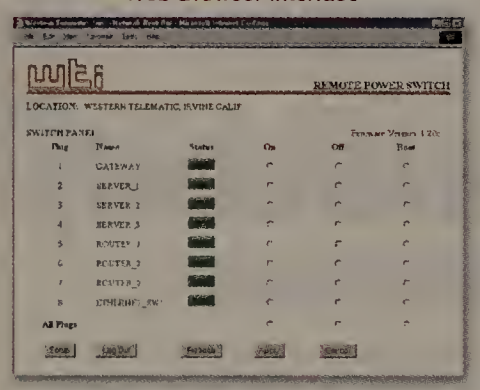
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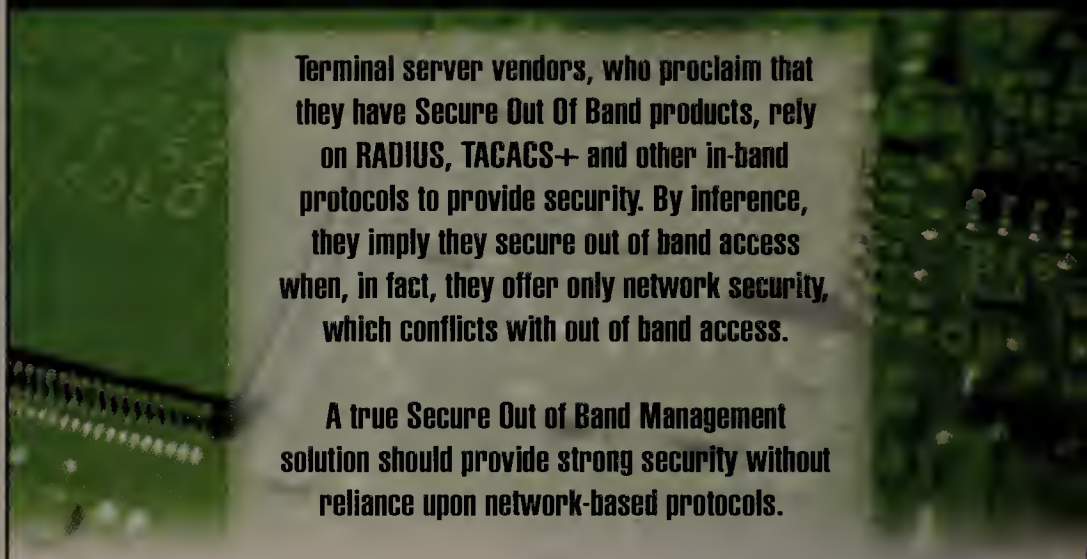
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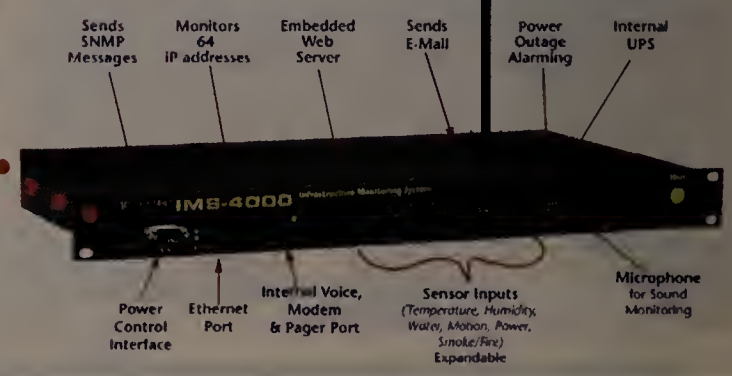
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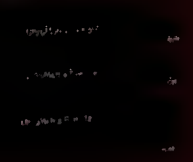
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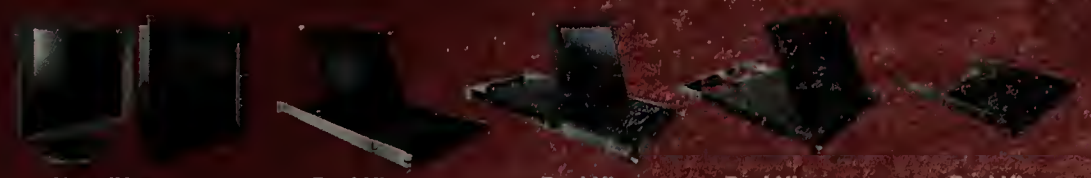
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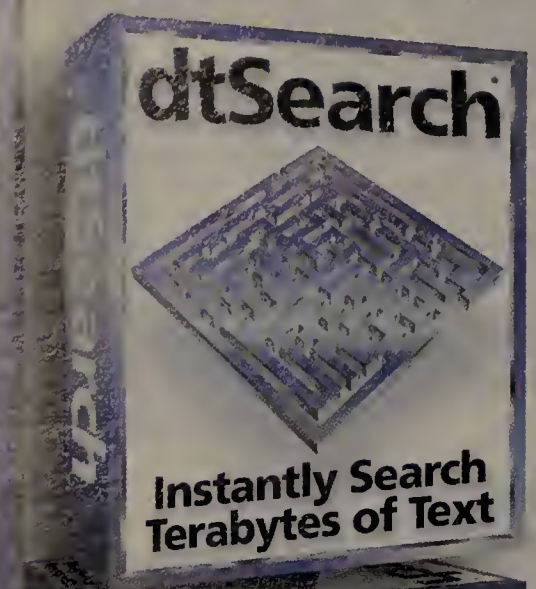
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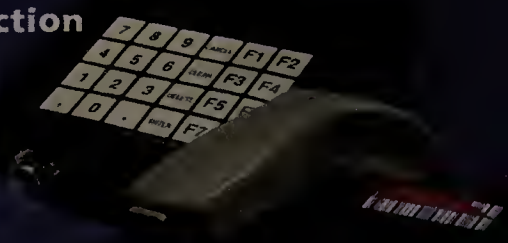


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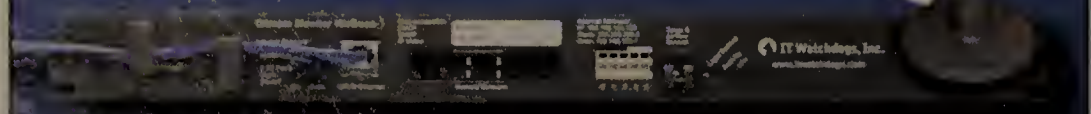
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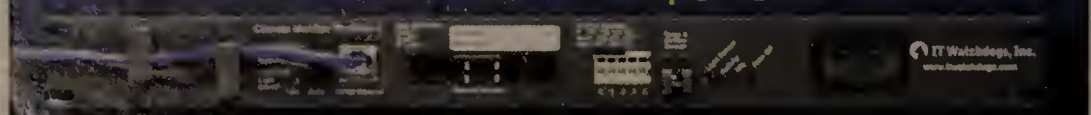
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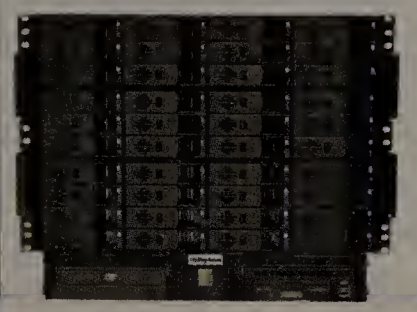
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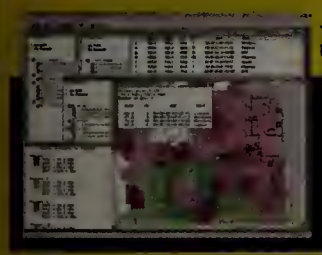
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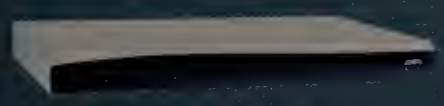
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